

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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BRIDGEPORT, CONN. SEE PAGE 3.

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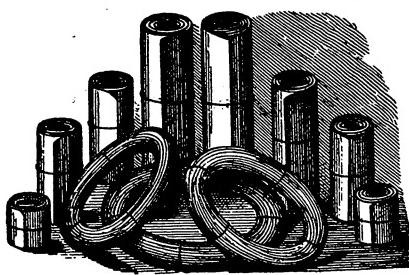
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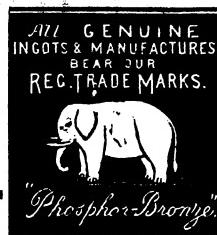
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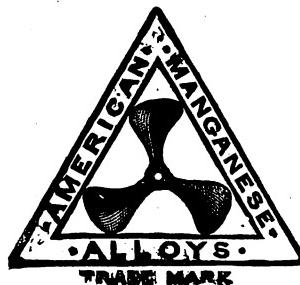


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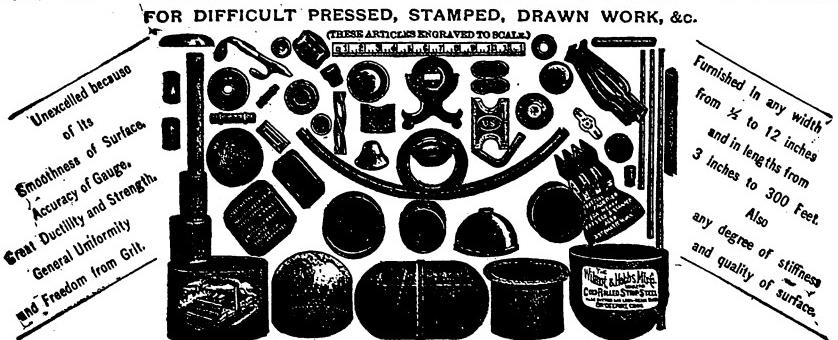
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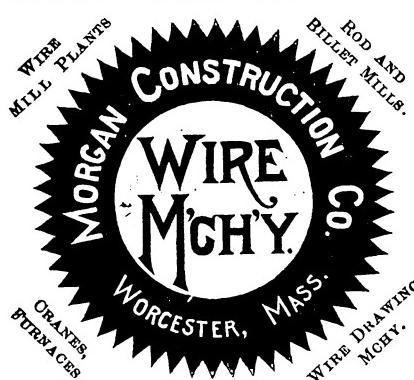
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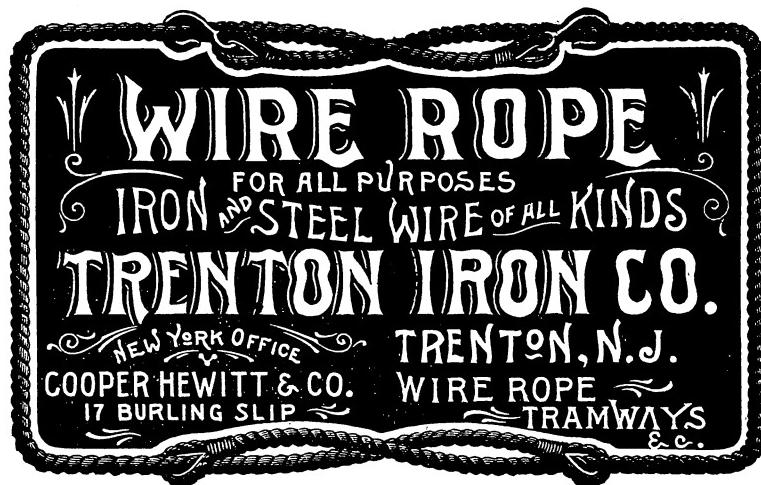
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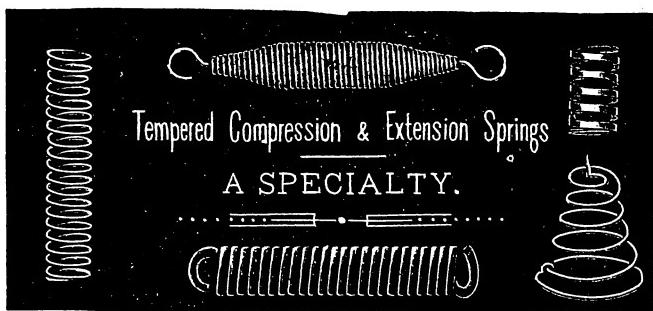
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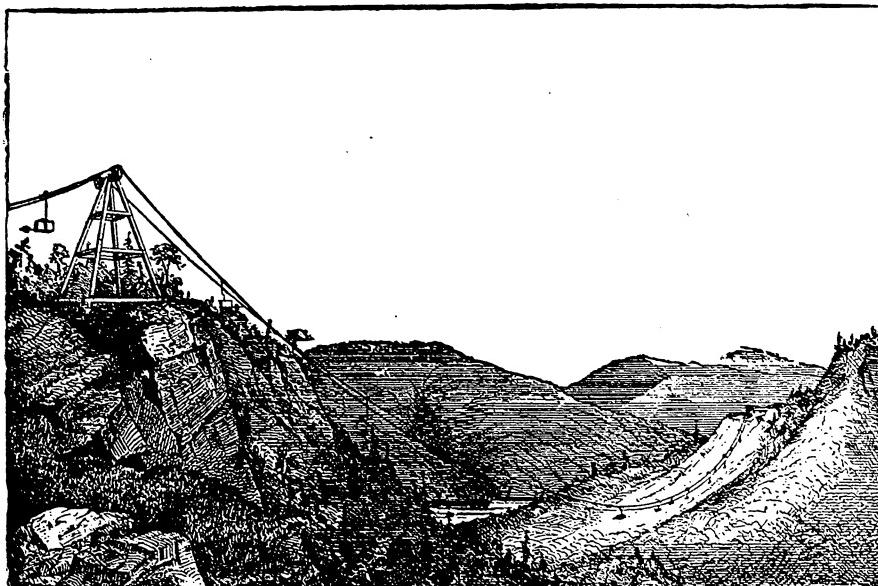
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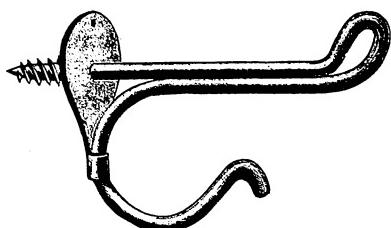
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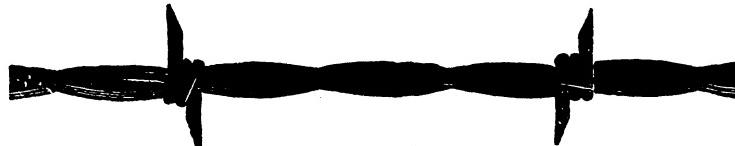
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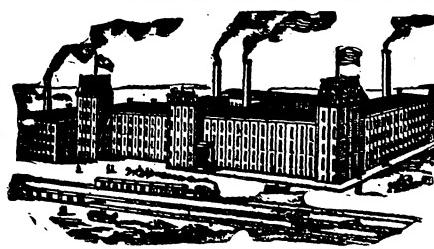
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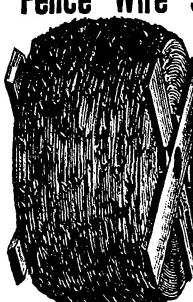
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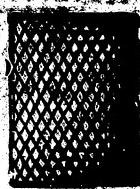


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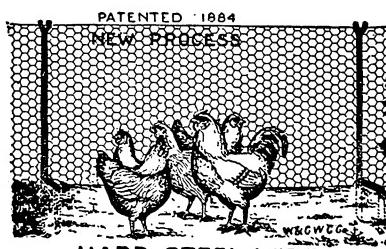
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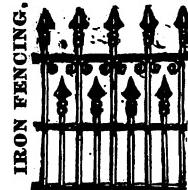
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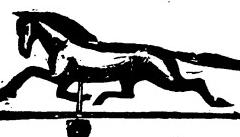
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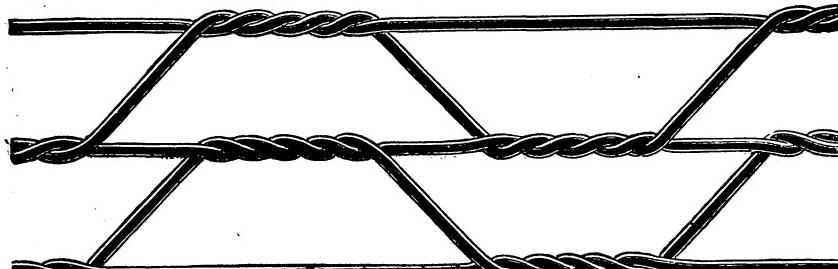
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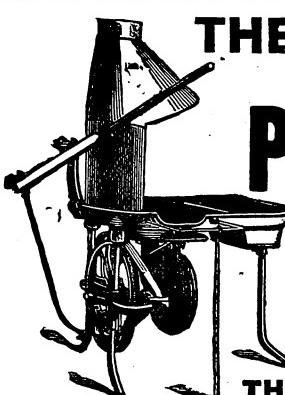
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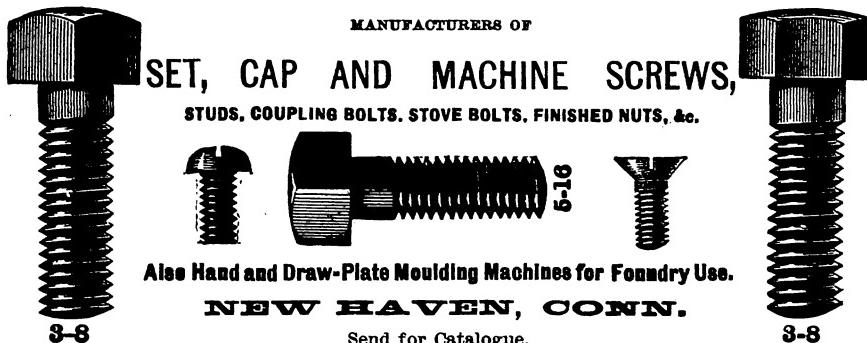
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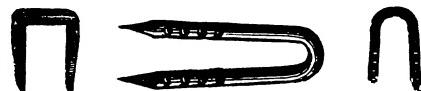
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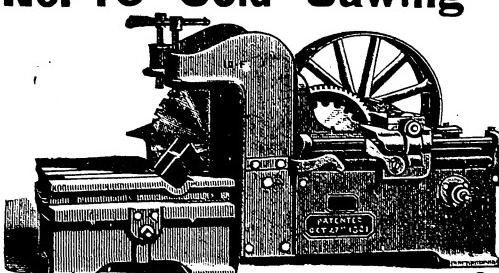
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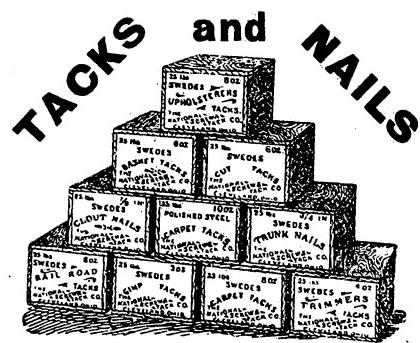
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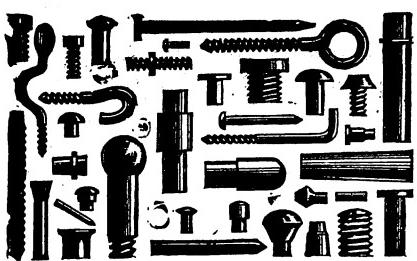
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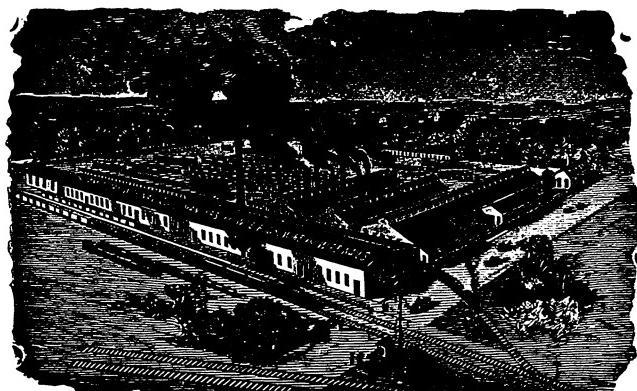
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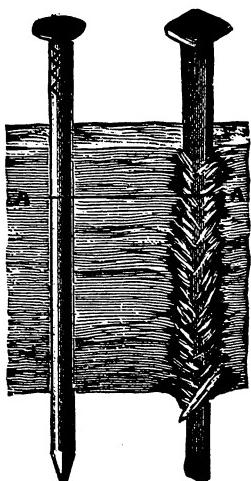
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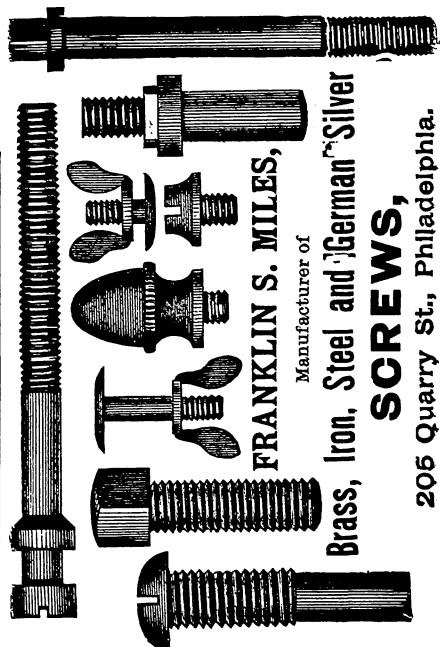
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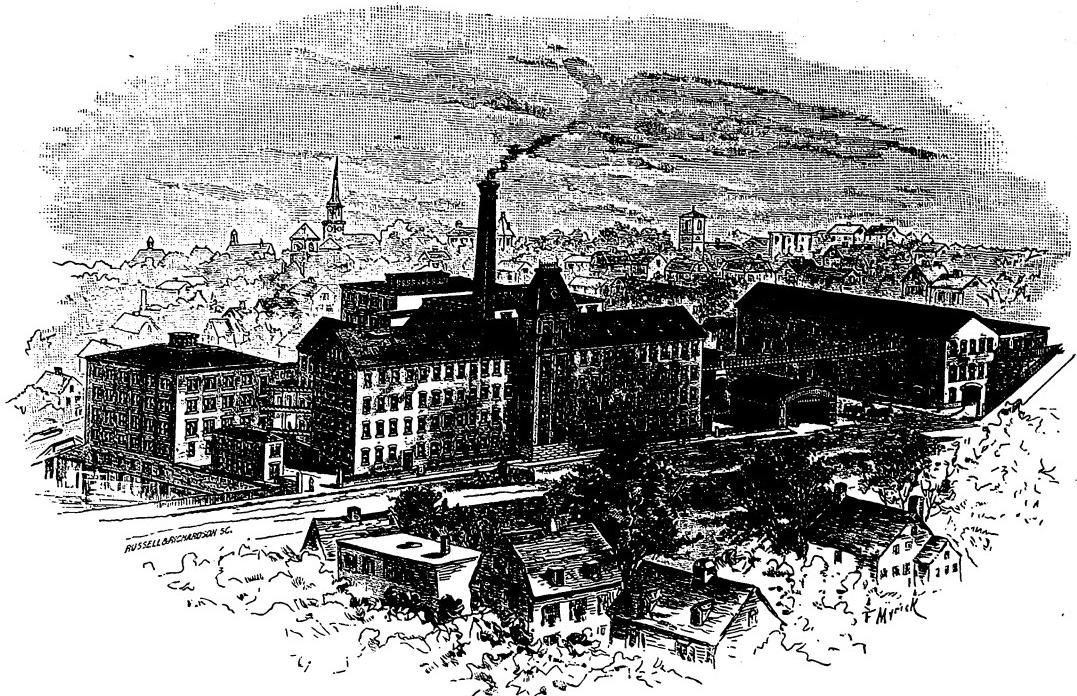


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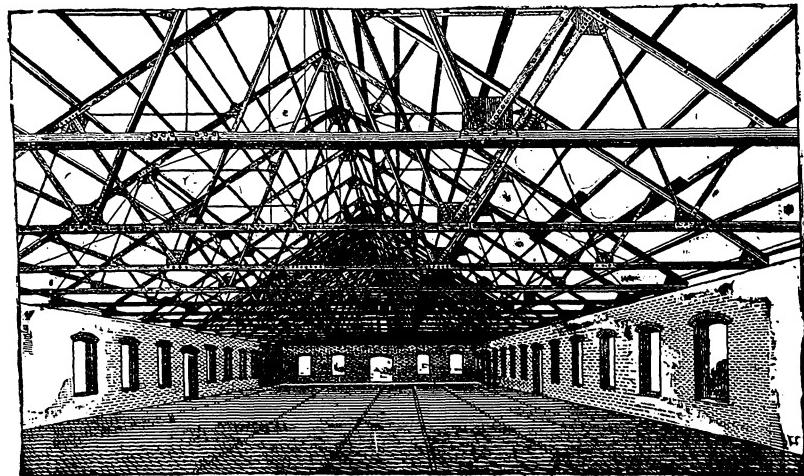
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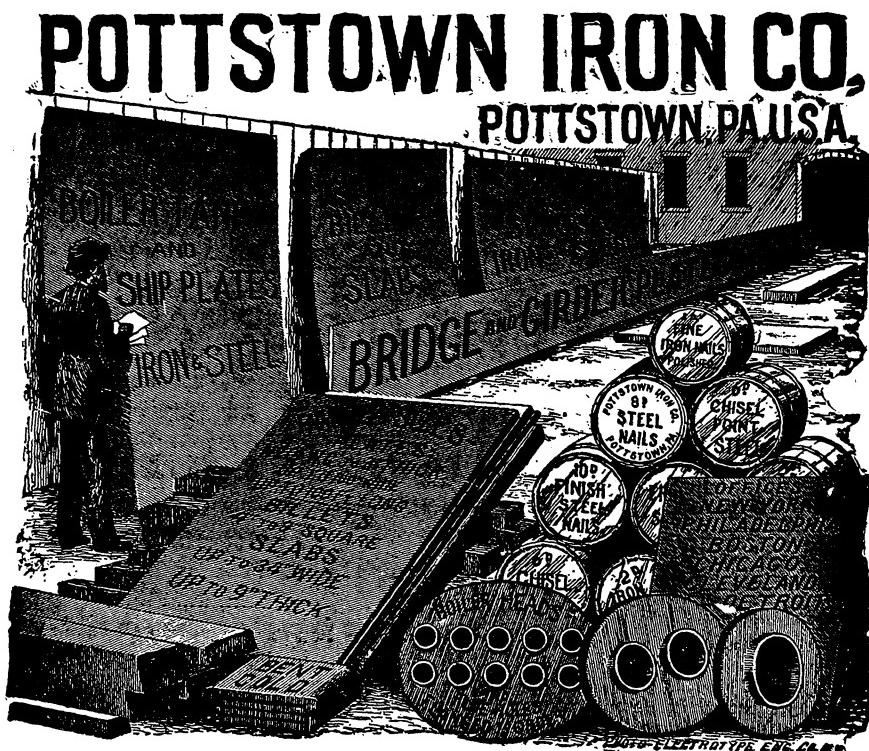
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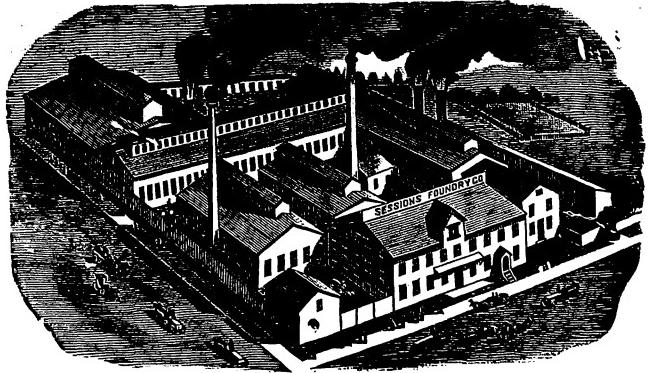
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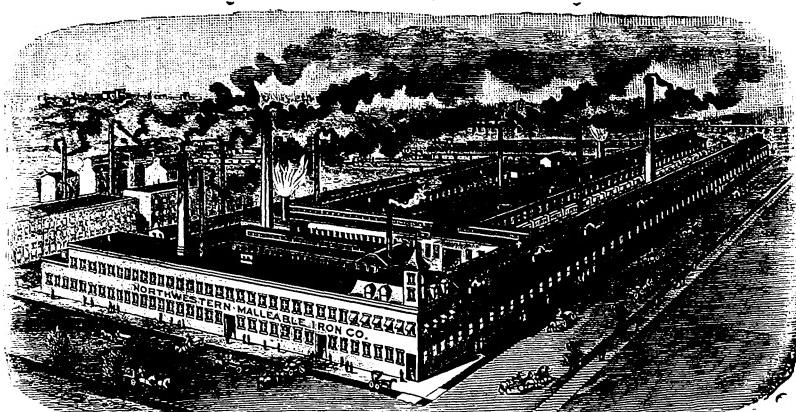
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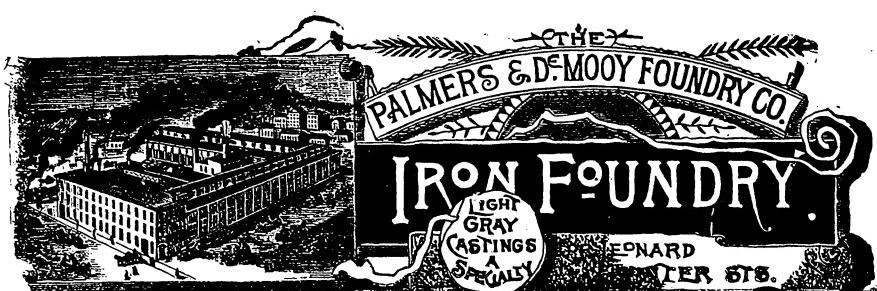
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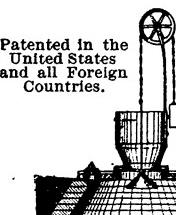
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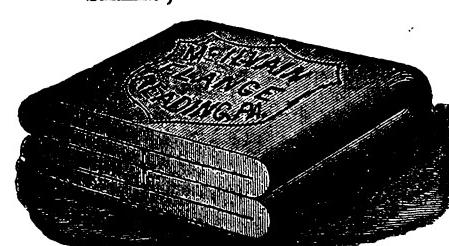
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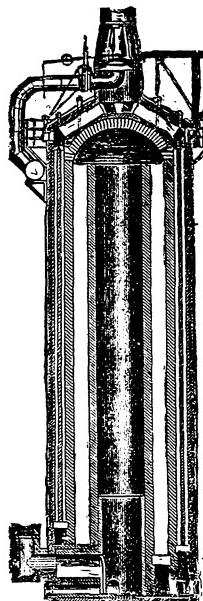
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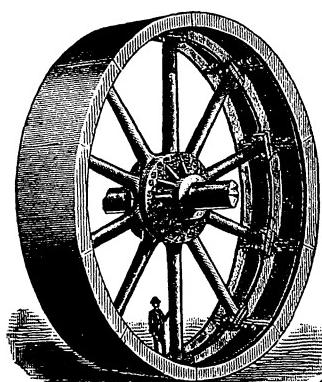
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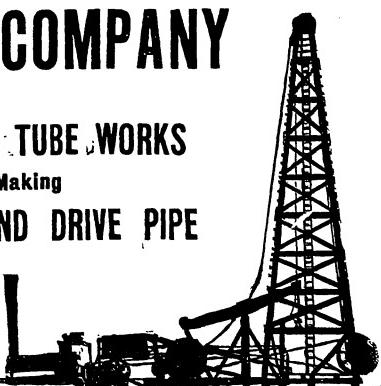
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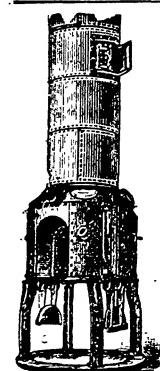
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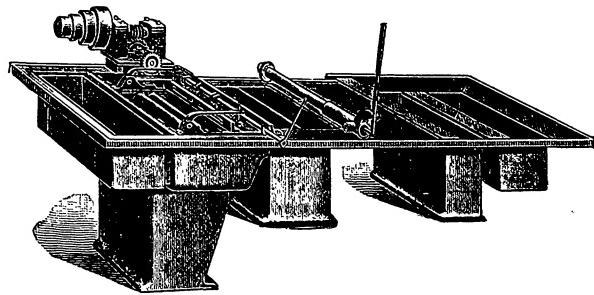
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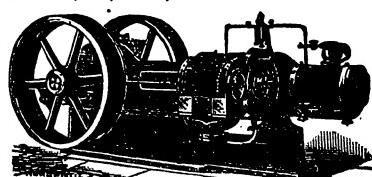


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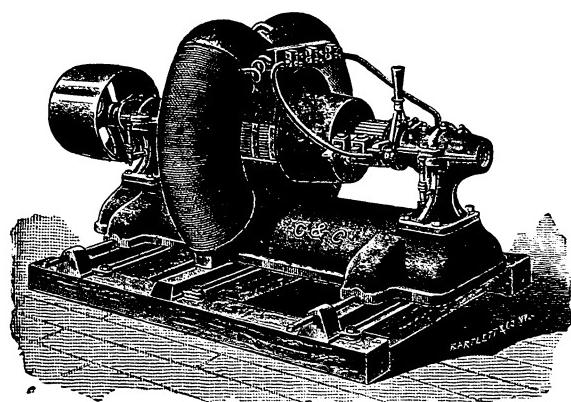
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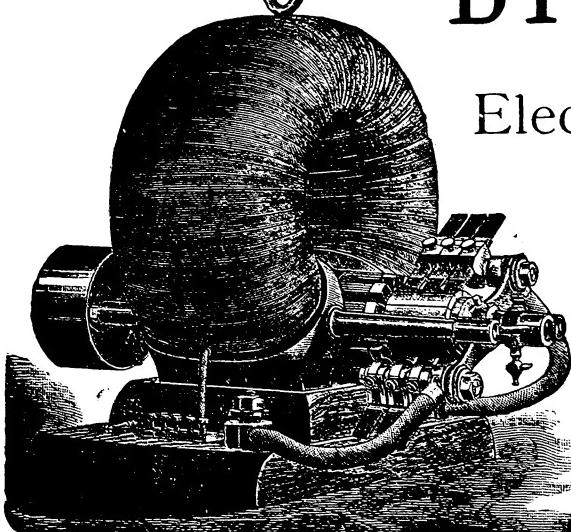
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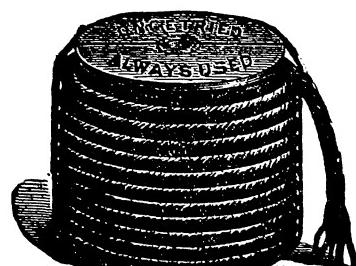
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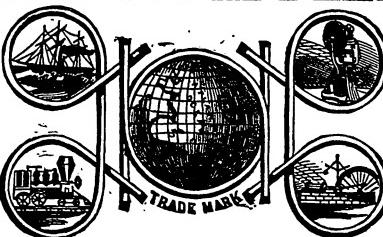
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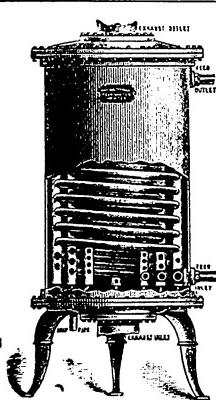
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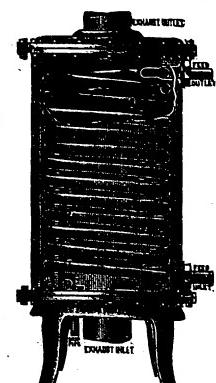
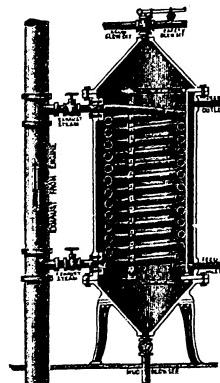
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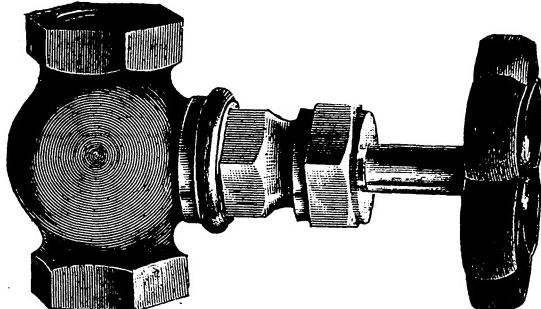


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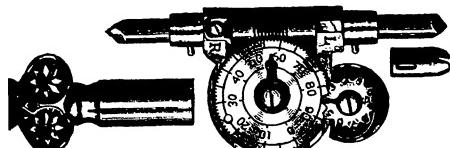
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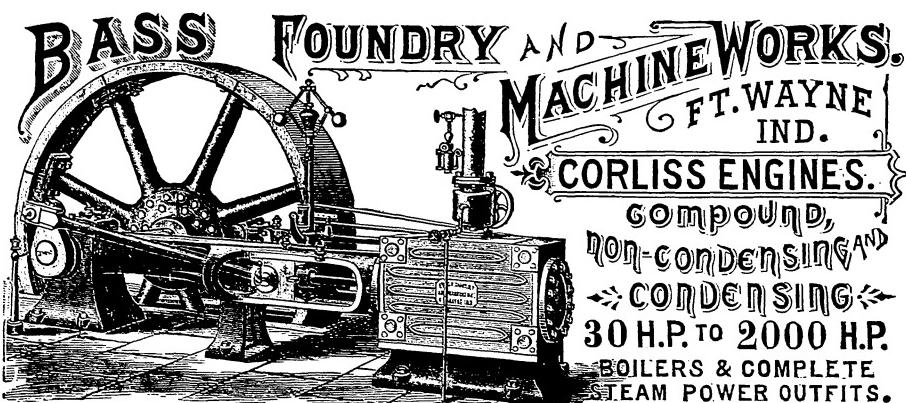
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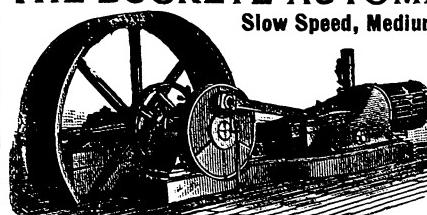


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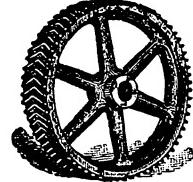
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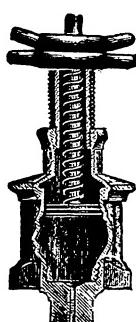
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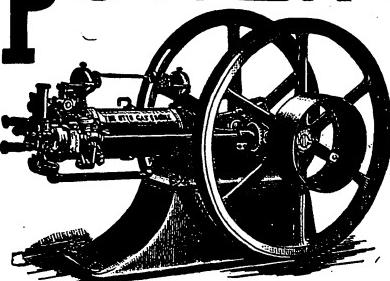
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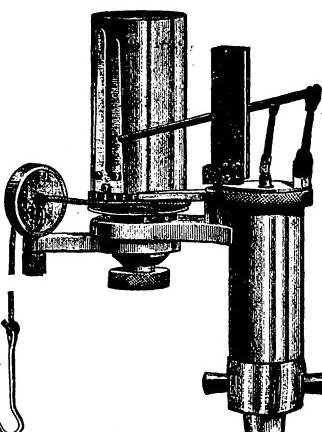
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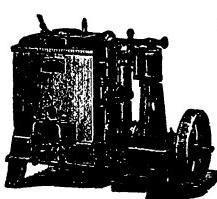
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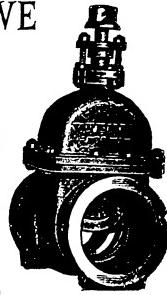
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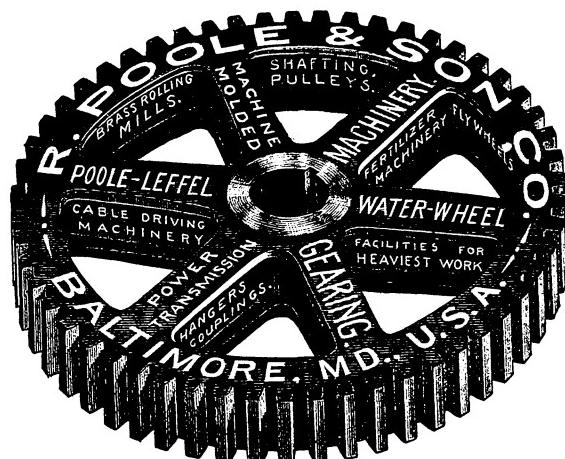
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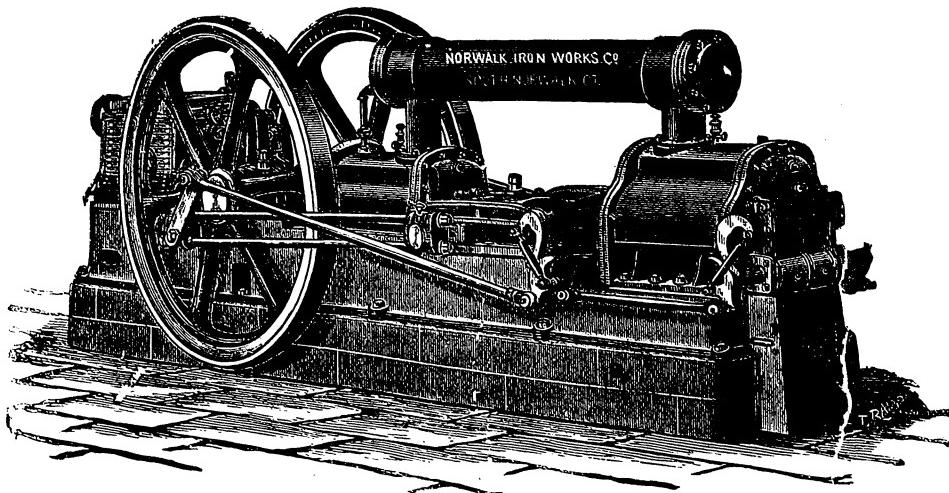
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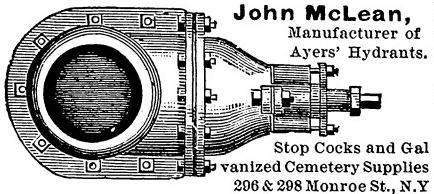
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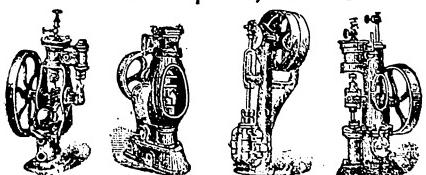
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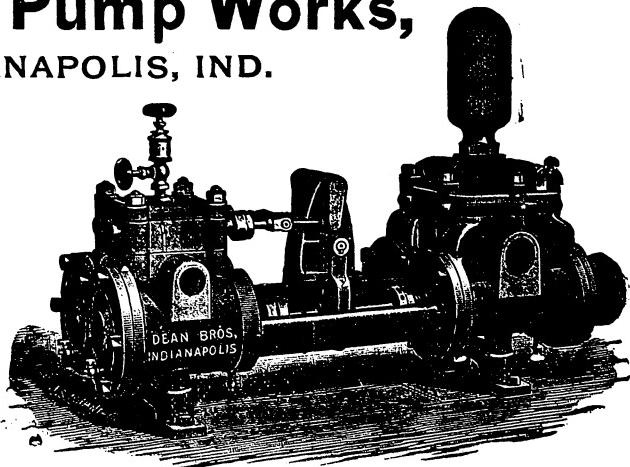
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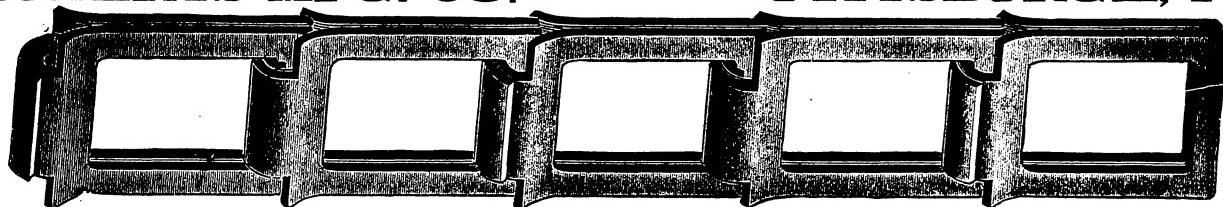
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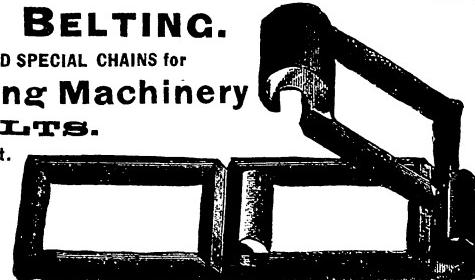
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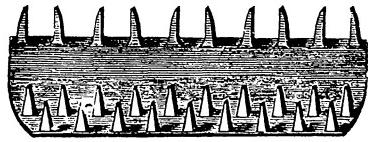
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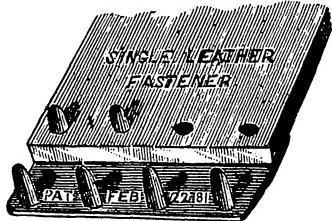


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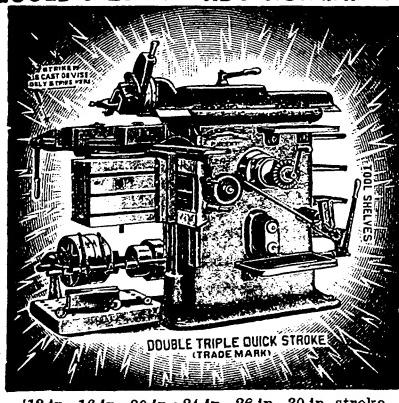
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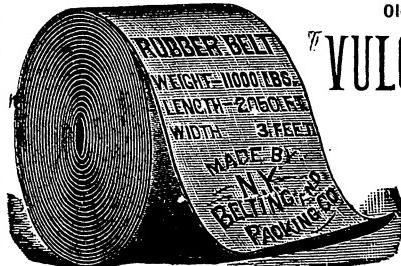
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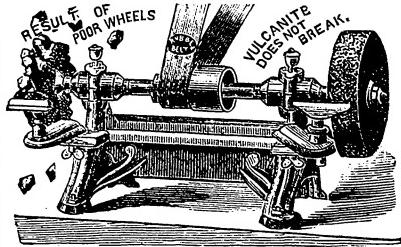
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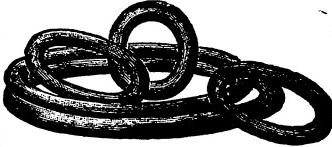
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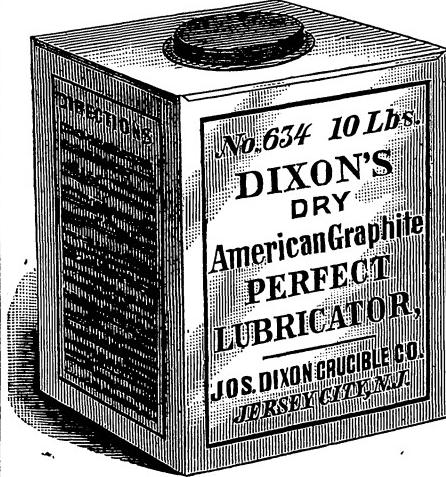
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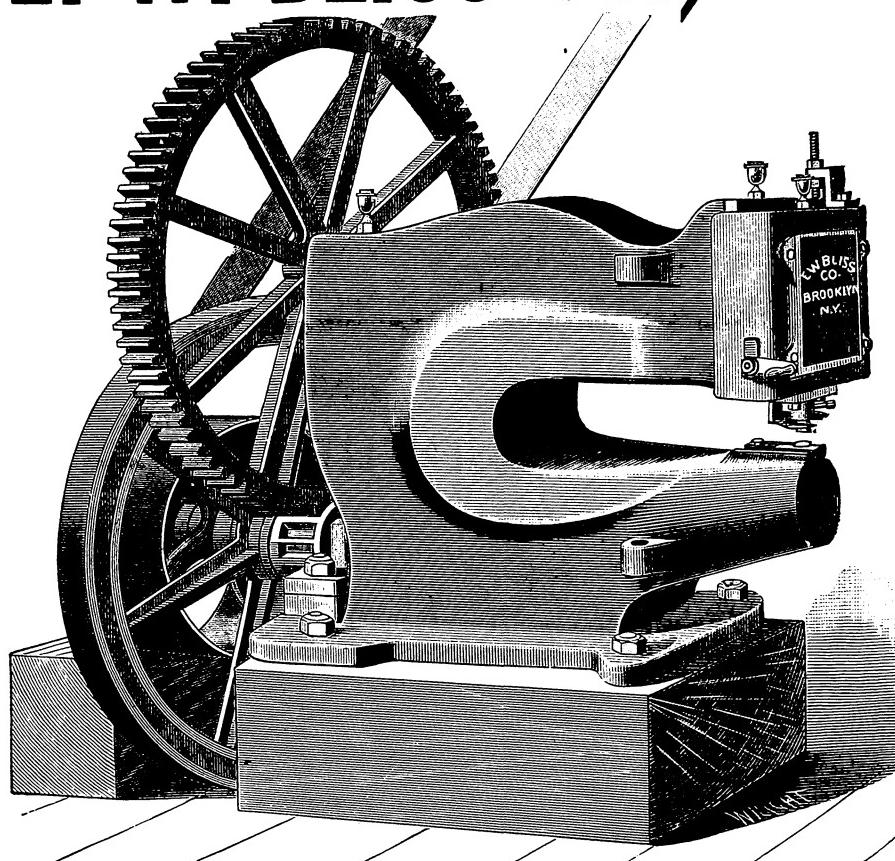
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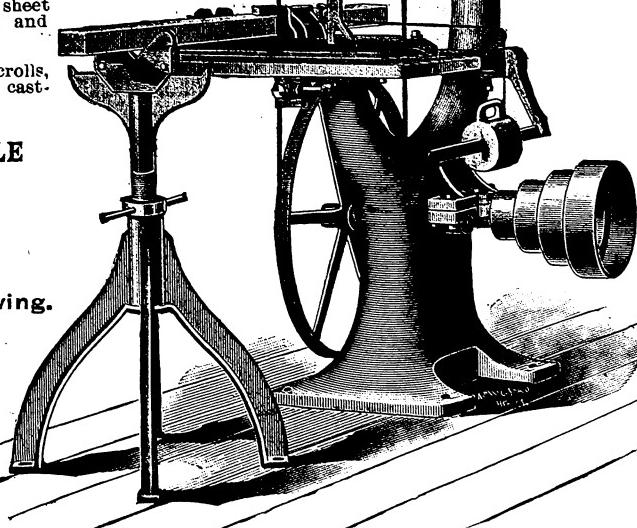
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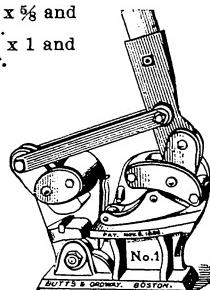
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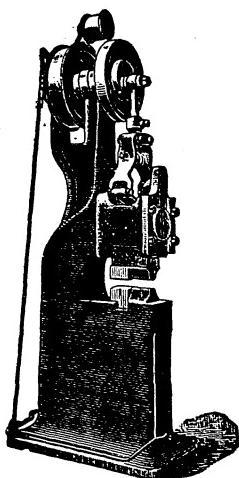
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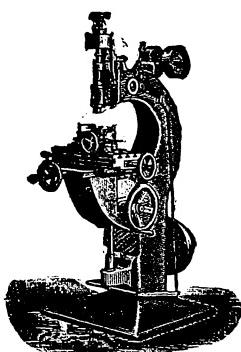
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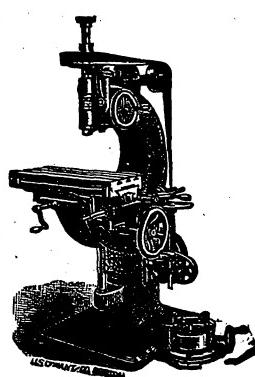
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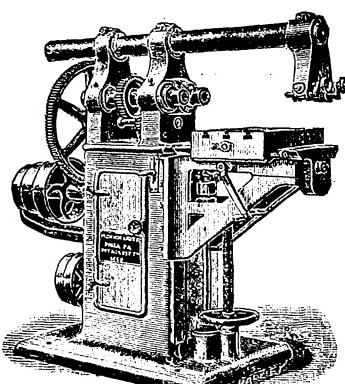
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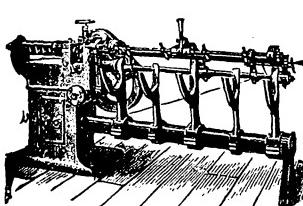
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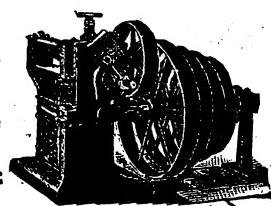
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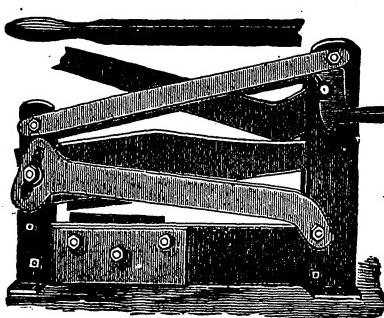
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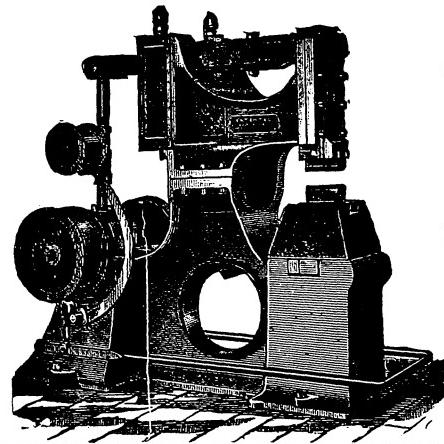
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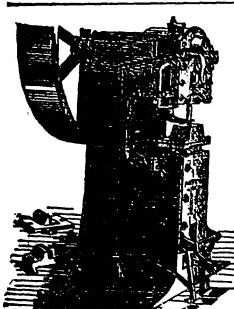
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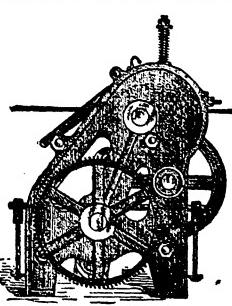
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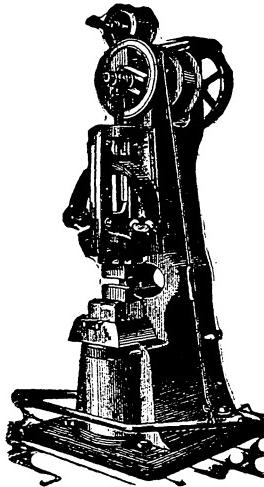
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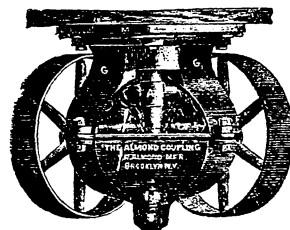
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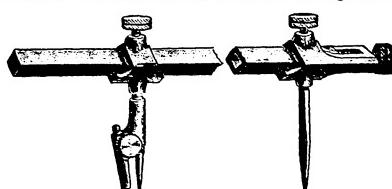
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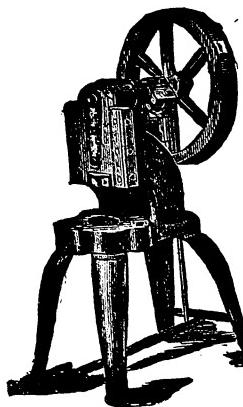
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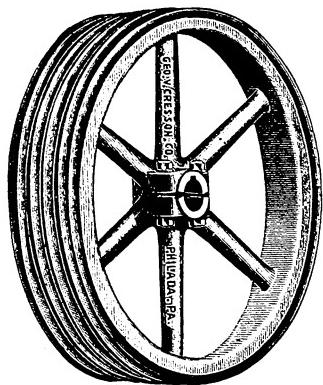
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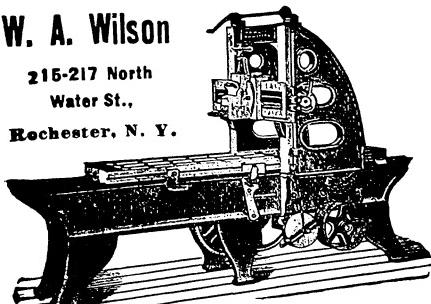


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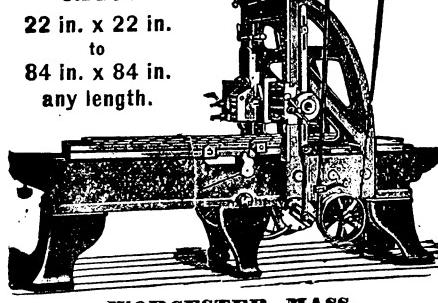


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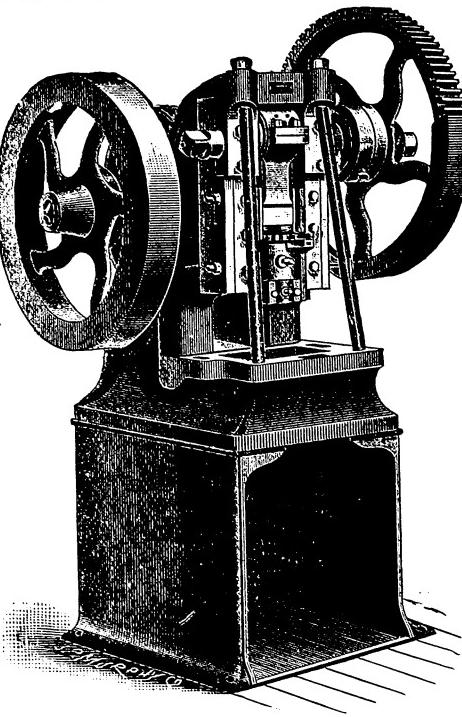
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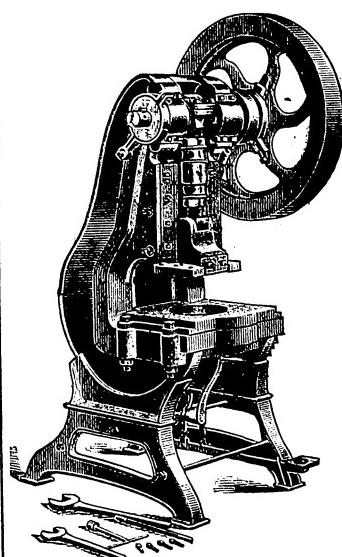
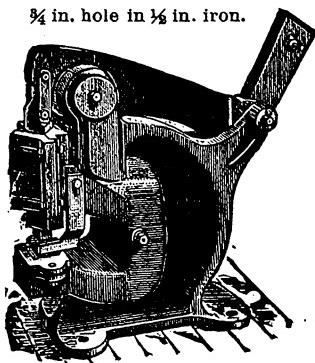
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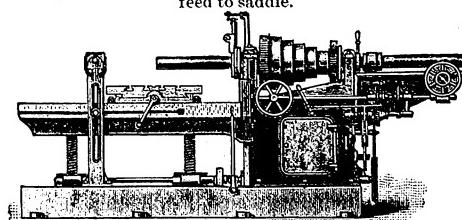
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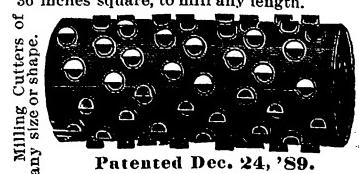
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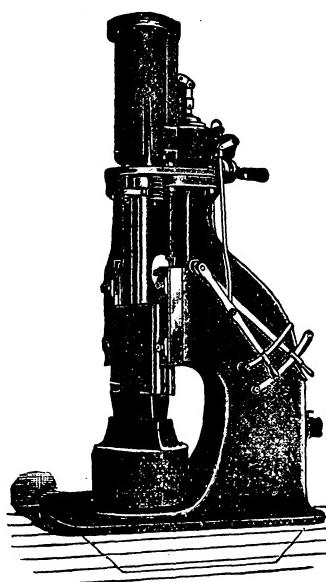
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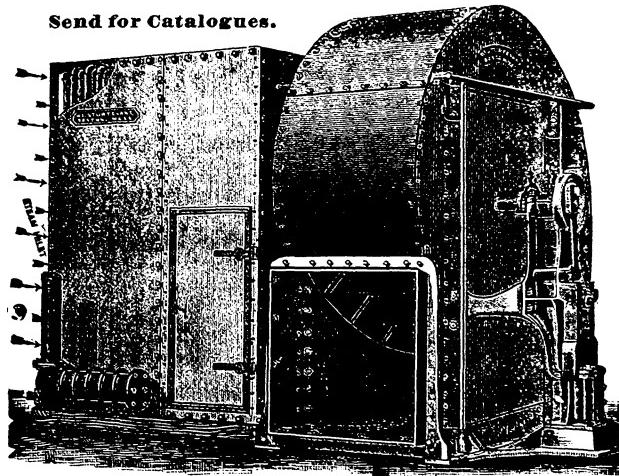
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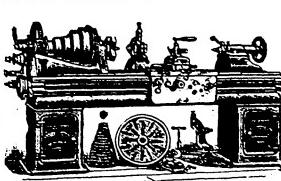
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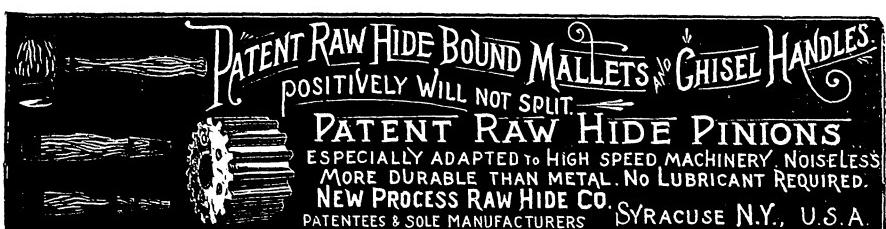
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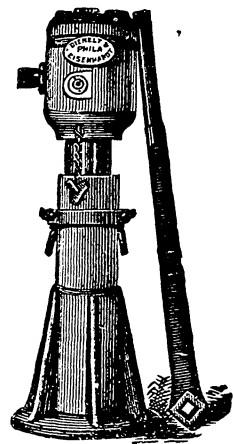


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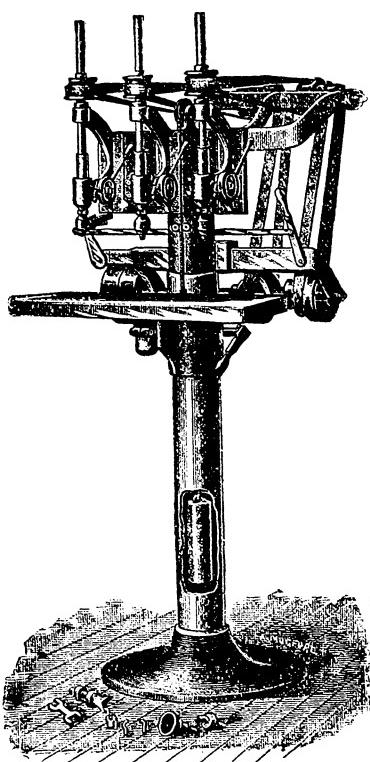


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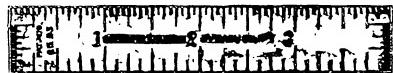
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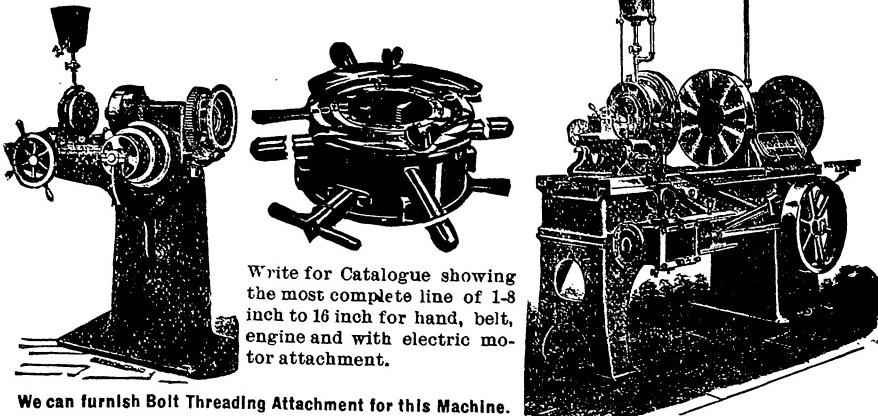
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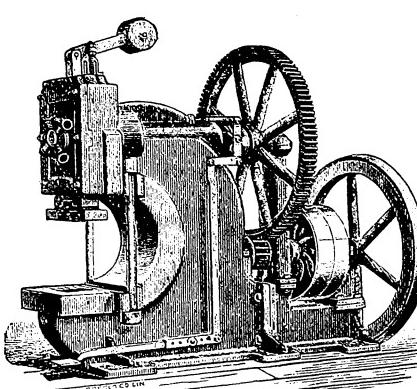
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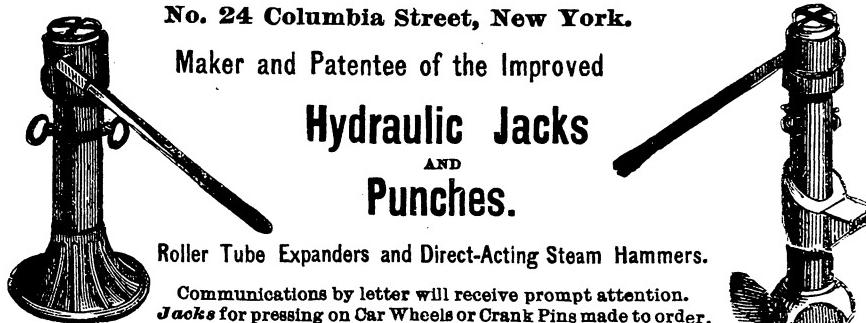
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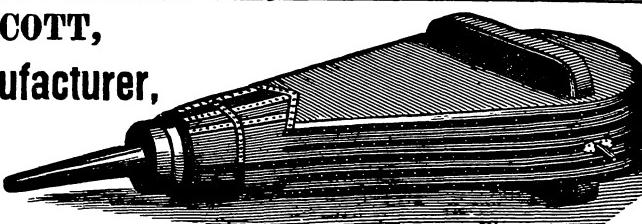
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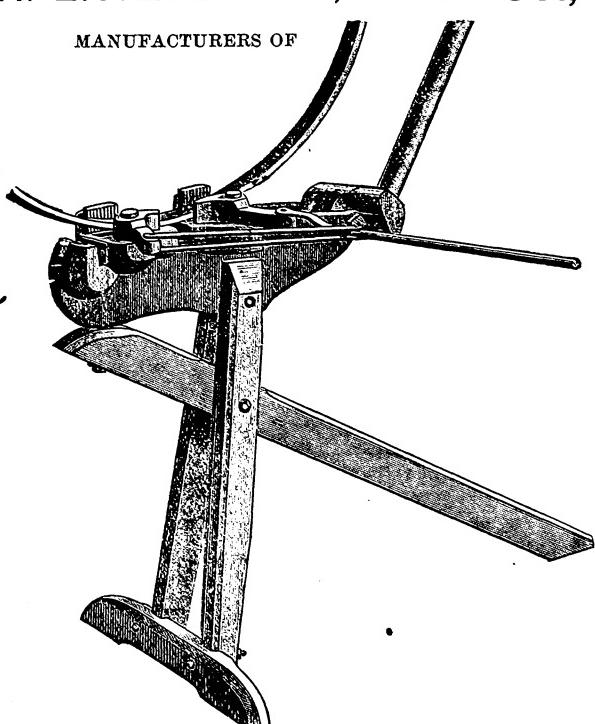


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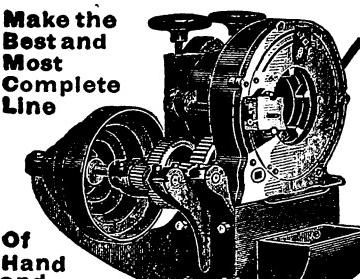
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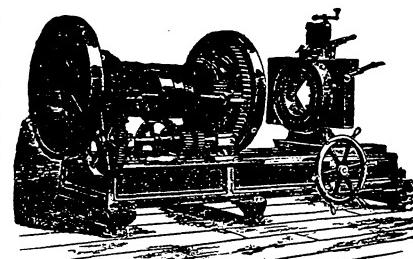
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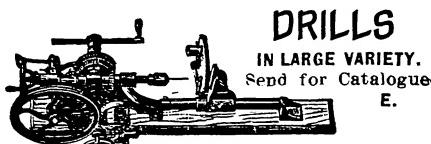


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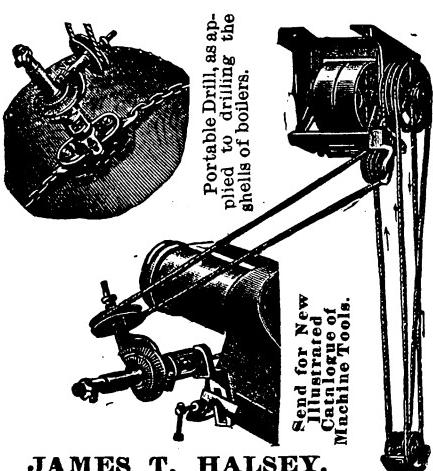
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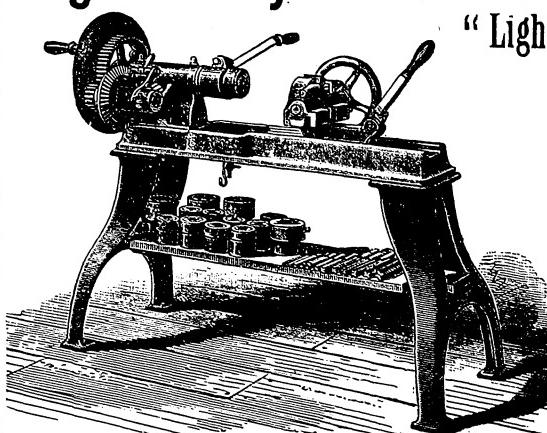
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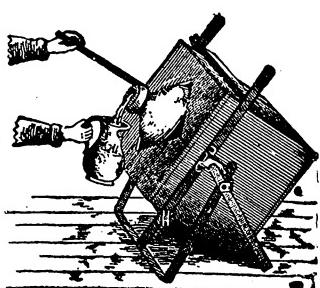
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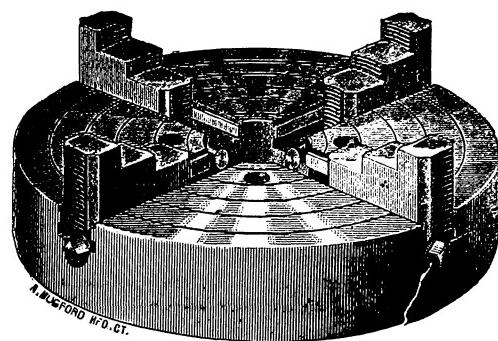
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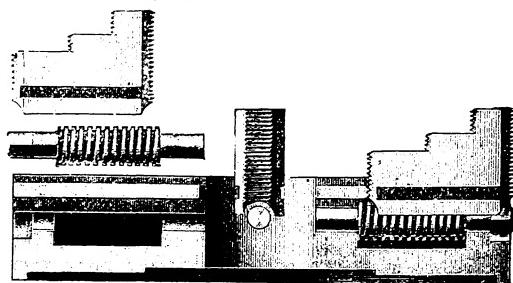
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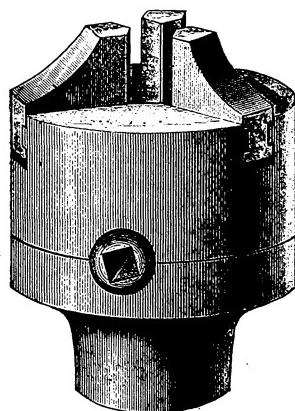
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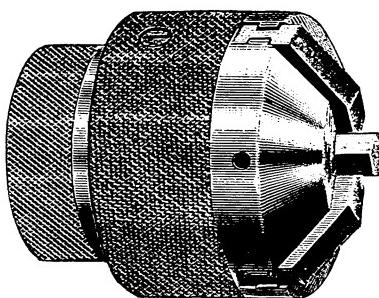
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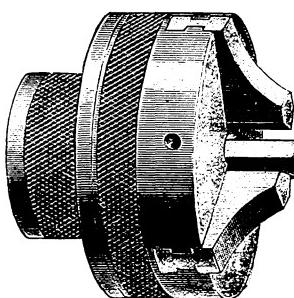
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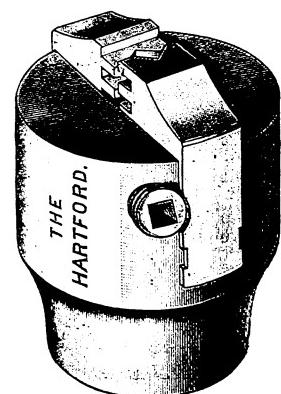
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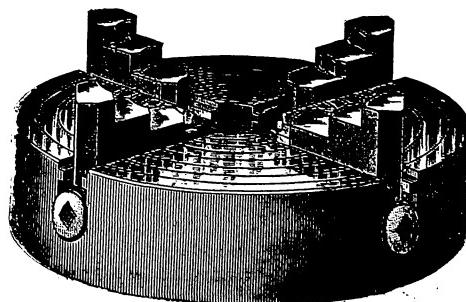
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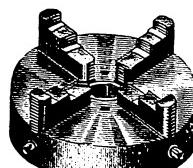
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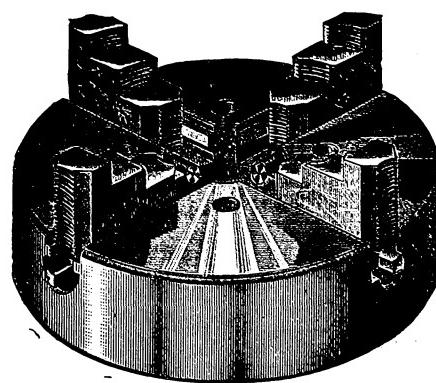
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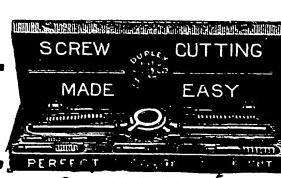
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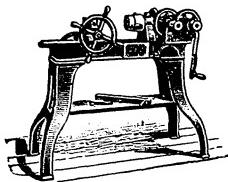
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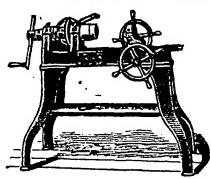
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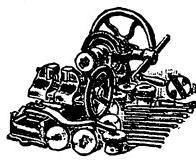
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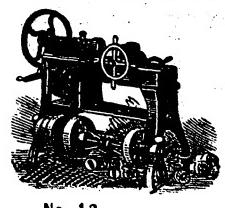
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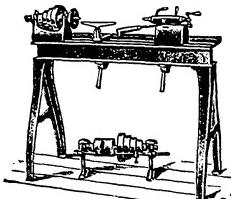
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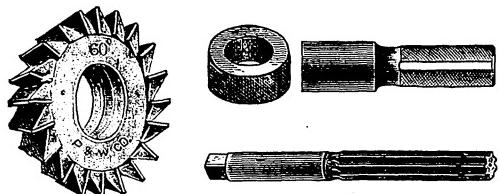
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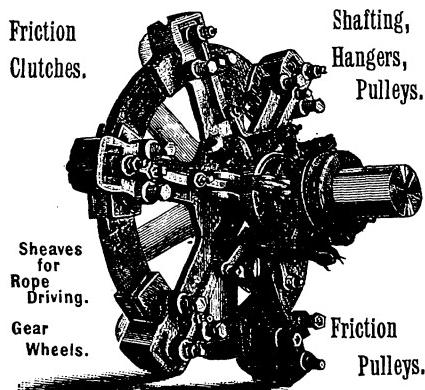
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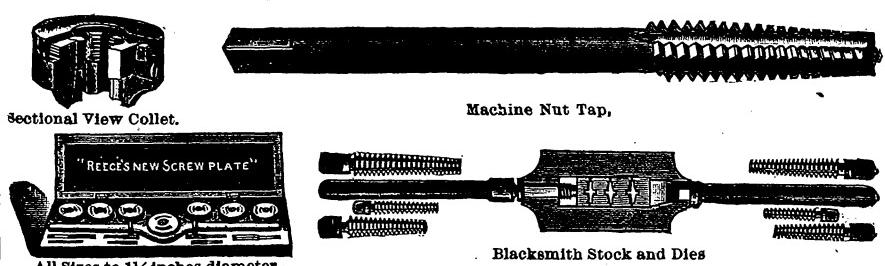
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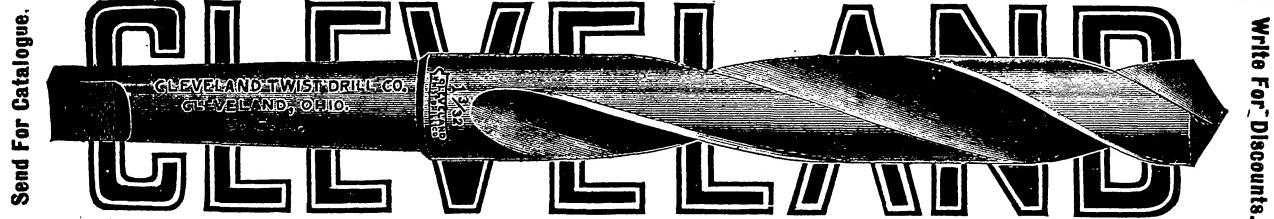
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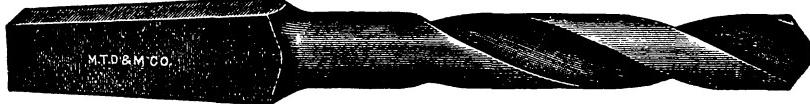
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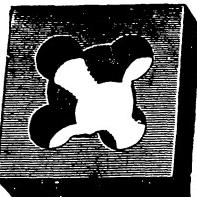
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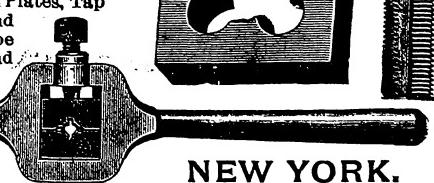
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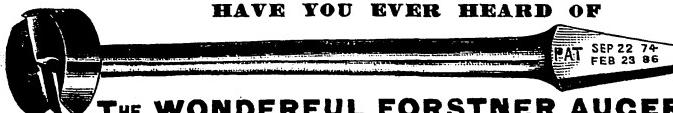
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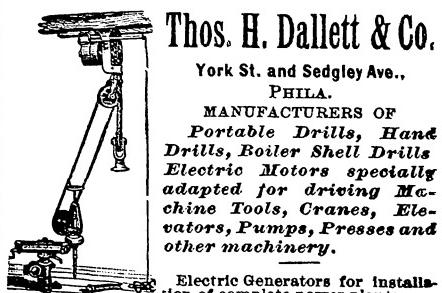
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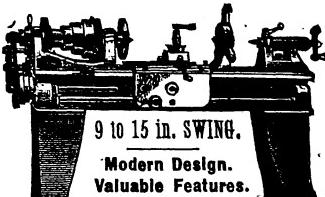
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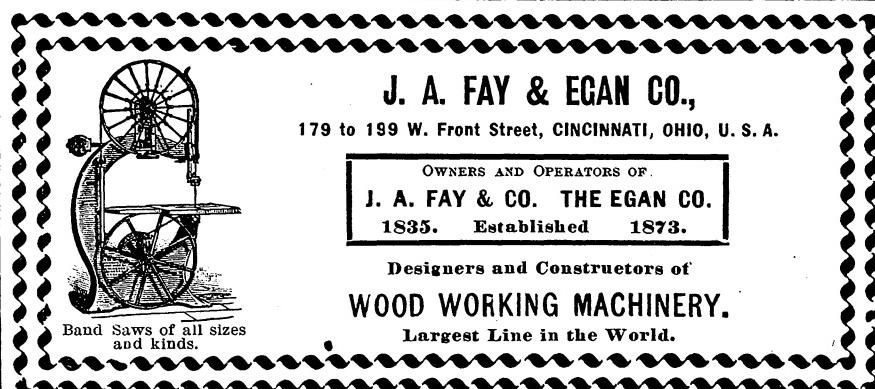
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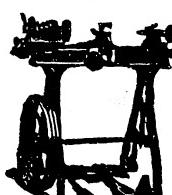
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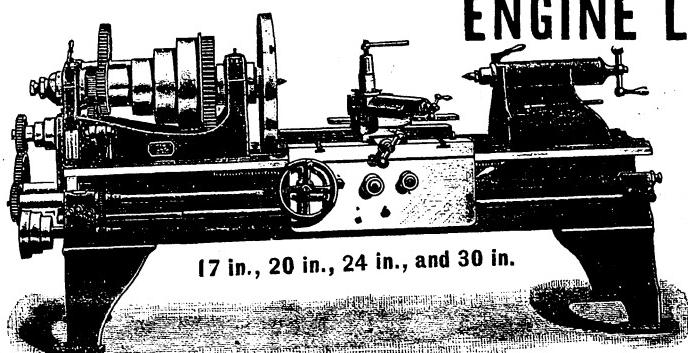
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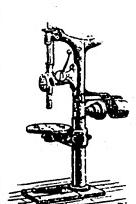
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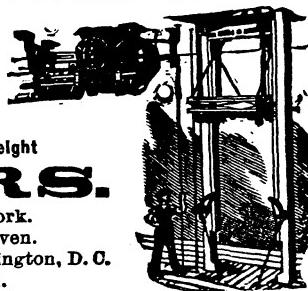
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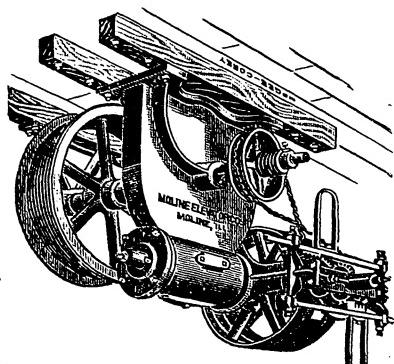
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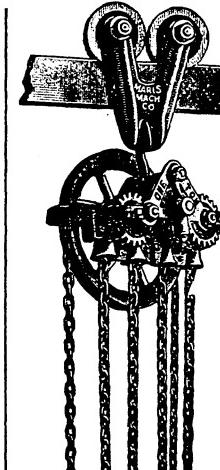
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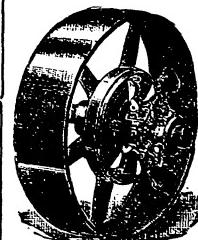
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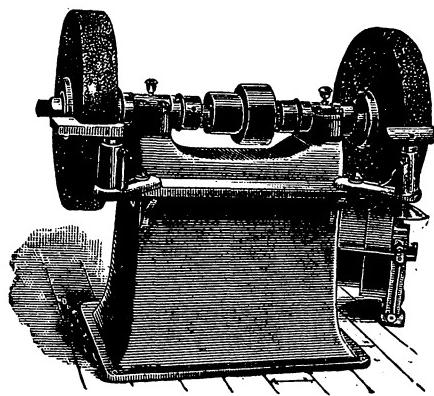
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IT'S TO Your Advantage to correspond with us regarding emery wheels.

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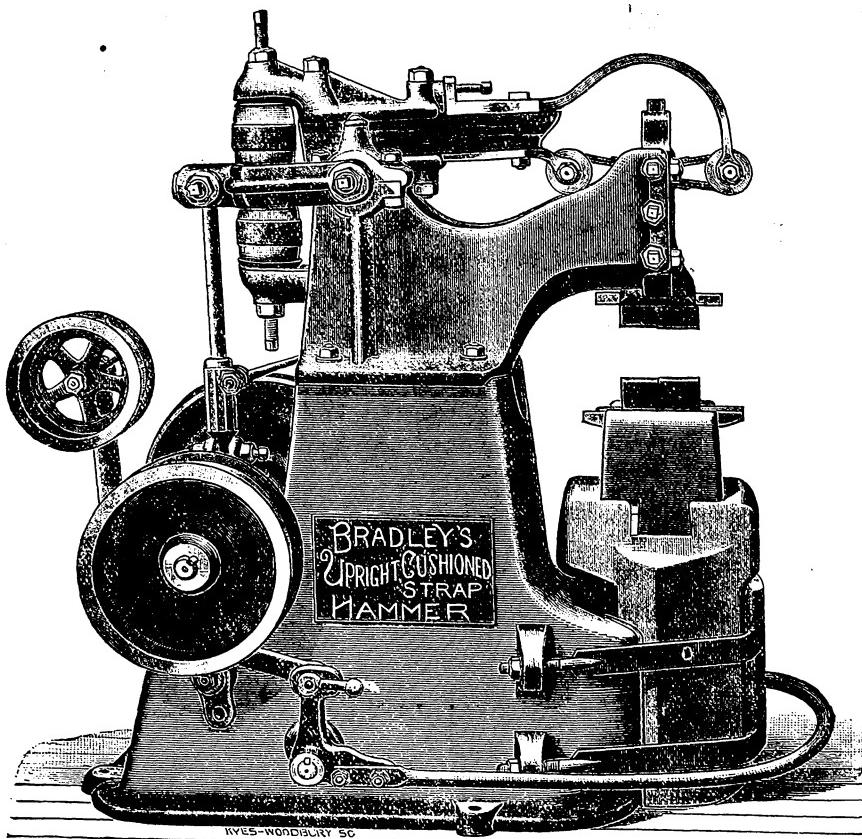
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More than
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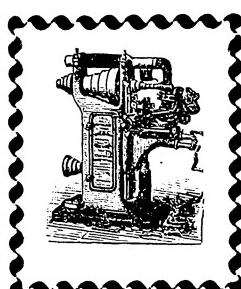
By our various processes we can insure satisfaction for the greatest variety of work

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to operate our Milling Machine than others, because it requires less time to get ready for and finish a job, while its workmanship is of the highest type. If you will write we'll send full information.

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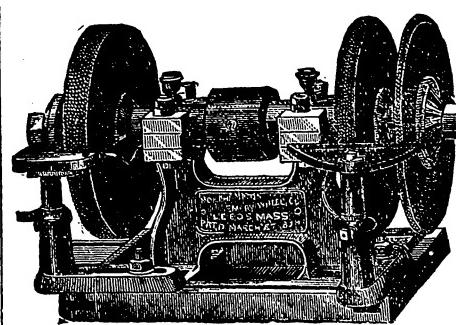
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Send for Catalogue. FACTORY AT LEEDS, MASS.

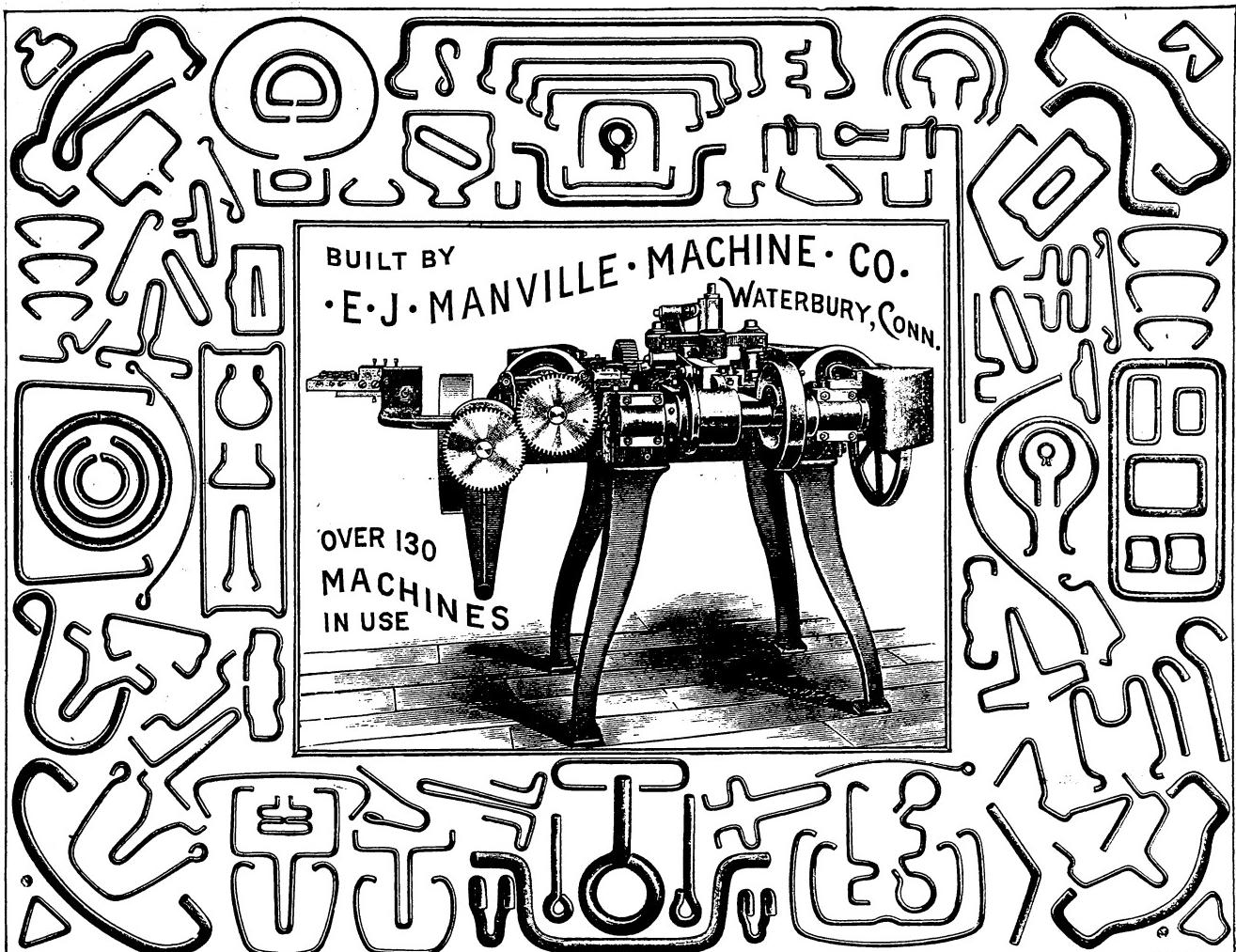


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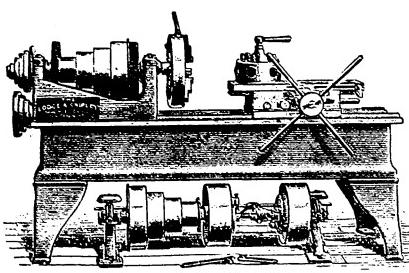
Robb's Bill Register,

For making a complete record of bills, thus dispensing with the use of ledger accounts for bills payable.

For complete description see *The Iron Age*, March 16, 1893, page 646.



Turret Chucking Lathes.



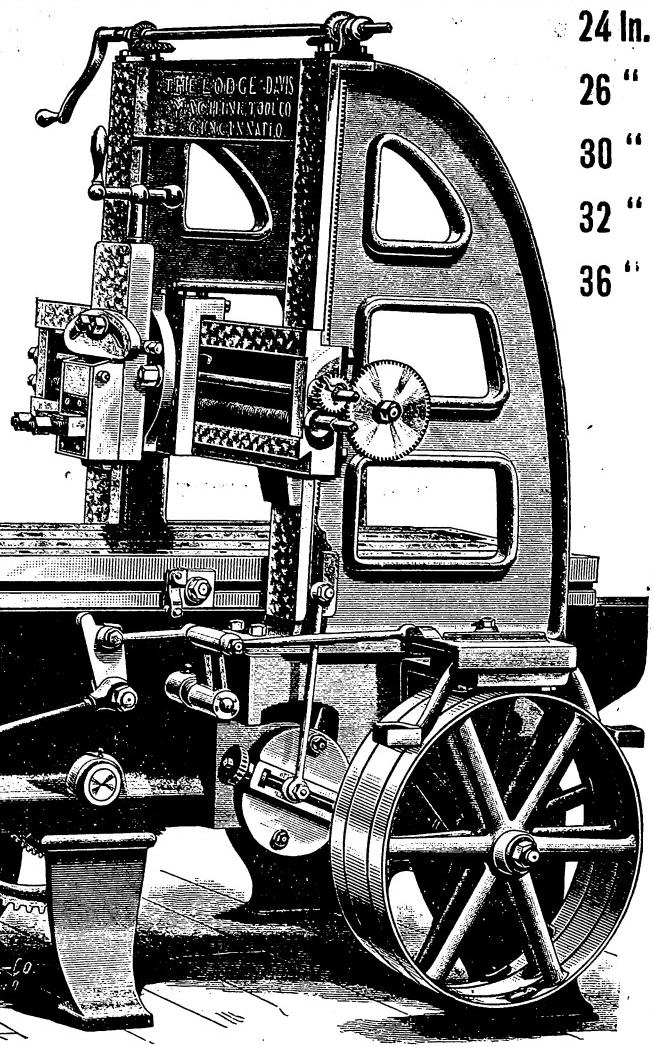
These lathes swing 22 inches, have 7-foot bed, and are back geared, driven by a 4-step cone for a 4-inch belt. The spindle is crucible steel. Front bearing, $3\frac{1}{2} \times 5\frac{1}{2}$ inches; back bearing, $3\frac{1}{2} \times 4$ inches. The bearings are phosphor bronze. Turret is 13 inches in diameter and is made to revolve automatically or by hand. When made to revolve automatically a lever is provided to withdraw the locking pin by hand, so that turret may be revolved at any point of its stroke. This avoids having to move the slide back to a given point, and permits of using one, two or any number of tools, and moving them backward or forward as the nature of work may require. They are provided with four changes for power feed, and an adjustable automatic stop for same. A pilot wheel is used for hand movement. The feed is particularly powerful and substantial. Also provided with friction counter shaft with back and forward movement and pulleys 14 inches in diameter, 5-inch face, which should run 130 revolutions per minute.

THE
LODGE & SHIPLEY
MACHINE TOOL
CO.,
Cincinnati, O., U. S. A.

IMPROVED
IRON PLANERS
 BUILT BY THE
**LODGE & DAVIS MACHINE TOOL
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Works: CINCINNATI, O., U. S. A.

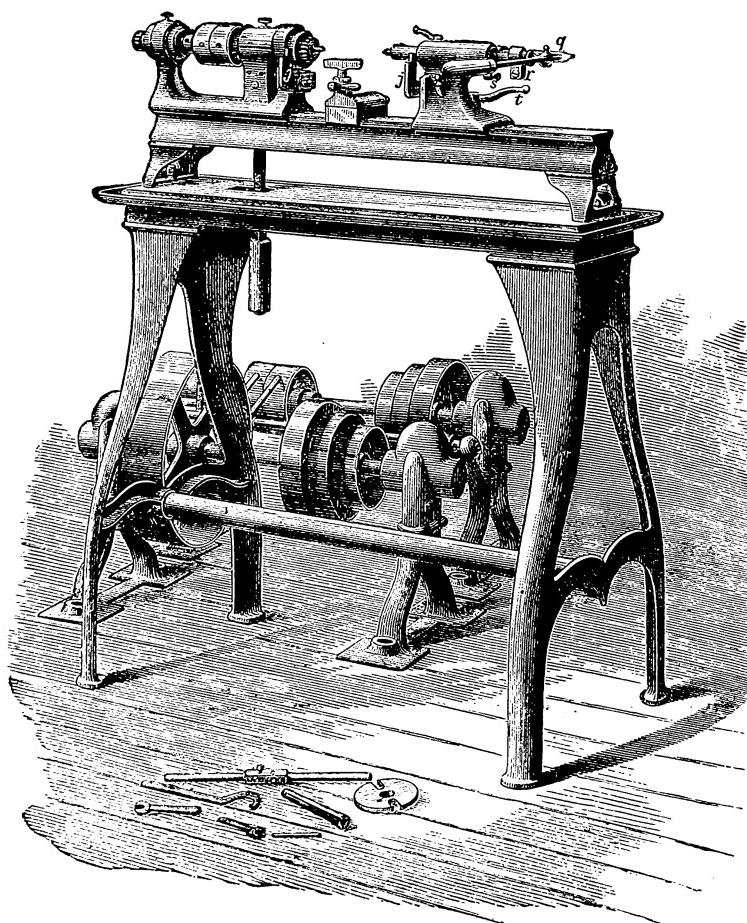
Complete Machine Shop Equipments
 a Specialty.



24 In.
 26 "
 30 "
 32 "
 36 "

BROWN & SHARPE MFG. CO., PROVIDENCE,
 R. I.

9" Universal Hand Lathe.



"Troy, N. Y., Feb. 27, 1889.
 Brown & Sharpe Mfg. Co.,

Providence, R. I.:

GENTLEMEN :—With reference to the UNIVERSAL HAND LATHE, bought of you in 1887, we can only say that, for the work we do with it, we find it the most satisfactory tool that we have in our shops.

We are, respectfully, yours,
 W. & L. E. GURLEY."

MACHINERY HALL ANNEX, Section 13, Crane Columns J, 46 and 47, Centre Aisle.

ENGLAND, Buck & Hickman, 280 Whitechapel Road, London, E.

GERMANY, G. Diechmann, Ansbacherstr. 5, Berlin, W. 62.

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BARGAINS In Second-hand TOOLS.

14 x 5 Windsor Lathe.
15 x 8 Barnes "
16 x 8 Porter "
18 x 8 New Haven Lathe.
18 x 8 Lathe & Morse Lathe.
18 x 8 Lodge & Barker Lathe.
20 x 8 Steptoe Lathe.
20 x 10 Porter " Good as new.
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24 x 16 New Haven Lathe.
25 x 20 Wood & Light Lathe.
36 x 20 Perkins Lathe.
96-in. Triple Geared Lathe.
16 x 8 Reinhagen Turret Lathe.
25-in. Pratt & Whitney Turret Lathe.
18 x 18 x 3 Putnam Planer.
30 x 30 x 5 Cove Planer.
30 x 30 x 7 New Haven Planer.
15-in. Lodge & Davis Crank Shaper.
20-in. " " Geared "
24-in. " " " "
26-in. " " " "
No. 8 Brainard Milling Machine.
5-ft. Plain Radial Drill.
Upright Drills, all sizes.
4½-in. stroke Newton Slotter.
30 and 40 lb. Herve Hammers.

**The Lodge & Davis
Machine Tool Co.,
WORKS, Cincinnati, Ohio.**
NEW YORK HOUSE, 110 Liberty St.
CHICAGO HOUSE, 68 & 70 So. Canal St.
BOSTON HOUSE, 23-25 Purchase St.
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MACHINE TOOLS, New and Second hand.

ENGINE LATHES.
12 in. x 5 ft. complete. Young.
13 in. x 6 ft. Cpd. Rest and Cross Feed, Improved style.
14 in. x 8 ft. complete. Hendey and Fitchburg.
15 in. x 6 ft. Prentice Bros.
15 in. x 8 ft. " with Chuck, modern. Al order.
16 in. x 6 ft. " with Taper, Fitchburg.
16 in. x 8 ft. Fair order. Low price.
17 in. x 6 ft. " with Cpd. Rest, Prentice.
17 in. x 8 ft. Improved style.
17 in. x 9 ft. " Low price. Lathe & Morse.
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22 in. x 10 ft. " extra heavy, Improved style.
24 in. x 12-14 ft. " Putnam style.
24 in. x 12 ft. " extra heavy, Improved style.
32 in. x 16 ft. " Heavy pattern.

PLANERS.

6-in. stroke, Crank. Good order.
8-in. " Gould. Good order.
9-in. " News & Phillips. Good order.
Heavy pattern.
13-in. " Trav. Head, 60-in. feed, extra heavy.
15-in. " Crank. New Improved style.
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26 in. " Triple Geared, Improved style.

DRILLS.

3-Spindle "Gang," Garvin. Good.
20-in. Wheel and Lever, Prentice.
26-32 in. Back Gears and Feed complete, Prentice.
Radial Drill, 4-6 ft. arms, extra heavy.

MISCELLANEOUS.

Upright Boring and Turning Mill, 38-in. swing.
Vertical Turret Chucking Machine, Brown & Sharpe.
Pulleys Turning and Boring Machine, 28-in. New style
Keyseating Machine for Pulleys and Whee's.
Milling Machines, Universal and Standard, pa. terms.
Milling Machine, Lincoln. Good order.
Slotting Machine, 8-in. Modern, complete.
Pat. Bolt Cutter, 1½ in., for cutting accurate threads.
Bliss style Punch Press.
Long & Allstatter style Punch and Shears.
Boiler Bending Rolls, 8 and 10 ft., "Improved style."

**J. J. McCabe,
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Successor to E. P. Bullard's New York
Machinery Warehouses.

BARGAINS.

Second-hand Machinery. Good Condition.
1 set of Bement Boiler Rolls, 10 ft. 7 in. wide.
1 250-lb. Double Frame Steam Hammer. Frederick Miles.
1 60-lb. Single Frame Steam Hammer. Frederick Miles.
1 250-lb. Justice & Shaw Dead Stroke Hammer.
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1 Niles Turret Lathe, 13 in. x 5 ft.
1 Pratt & Whitney Planer, 16 in. x 16 in. x 3 ft.
1 40-in. Schumacher Drill Press, B. G. & P. F.
8 28-in. Schumacher Drill Presses, B. G. & P. F.
1 24-in. Bement Drill Press, B. G. & P. F.
1 Power Punch; capacity, 16-in. hole in 16-in. iron.
Punch to the center 12-in. sheet. Parker, Sino & Co., Fowler patent.
1 20-in. x 42 in. People's Works Horizontal Engine.
6, 8, 10, 12, 15, 20 and 40 H.-P. Holisting Engines.
1 Davidson Steam Pump, 12 in. x 3 in. x 14 in.

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METAL WORKING MACHINERY.

All kinds.

NEW AND SECOND HAND.

600 Machine Tools in Stock.

Send for lists of Second-hand Machinery and Secure Bargains.

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PLANER, 28 in. x 26 in. x 8 ft., table. Good order \$350.00
" 30 in. x 30 in. x 6 ft., with chuck. Re-built 275.00
24-in. Heavy Shifting Belt SHAPER. New 300.00
LATHES, 18 in. x 10 ft., with chuck. Good order. 160.00
40-in. Heavy DRILL PRESS. Good as new.... 335.00
26-in. " " " Plain 85.00
21½-in. Heavy Lever Feed DRILL. New 54.00
FORG'G DROP, 100-lb. Hammer, New Design. 160.00
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BOLT CUTTER, New Head and Dies ¾ to 1½ in. 175.00
7 x 9 ENGINE. Splendid order 85.00
POWER PUNCH PRESSES \$75.00 and upward.

AMER. TOOL WORKS., Cleveland, U. S.

SECOND-HAND MACHINISTS' TOOLS.

1 Planer, planes 15 ft. 42 in. x 42 in.
1 Planer, planes 6 ft. 32 in. x 26 in.
1 Planer, planes 5 ft. 24 in. x 24 in. Whitcomb.
1 Planer, planes 5 ft. 24 in. x 24 in.
1 Planer, planes 5 ft. 22 in. x 22 in., old style, cheap.
1 Planer, planes 4 ft. 24 in. x 24 in.
1 Crane Planer, 2 ft. 18 in. x 12 in. Al.
1 Engine Lathe, 18 ft. bed, 82 in. swing, for Boring and Turning.
1 18 ft. 24 in. Lathe.
1 12 ft. 22 in. Lathe. Good order.
1 11 ft. 18 in. Lathe. Good order.
3 6 ft. 14 in. Blaisdell Lathes.
2 6 ft. 15 in. Wood & Light Lathes.
1 6 ft. 18 in. Lathe.
1 Pratt & Whitney Cushioned Hammer.
1 36-in. Back Geared New Haven Drill.
1 Brown & Sharpe Universal Grinding Machine. Al.
2 20-in. Wheel and Lever Feed Drills.
1 Small "Eureka" Steam Hammer.
And various other tools.

NEW YORK MACHINERY DEPOT,
Bridge Store No. 16, on Frankfort St., New York.

FOR SALE.

1 each Garvin No. 2 & No. 4 Milling Machines, 2d hand.
1 17 in. x 11 ft. 6 in. Blaisdell Engine Lathe, " "
1 17 in. x 8 ft. McMahon " " "
1 28 in. x 8 ft. New Haven " " "
1 26-in. Post Drill, second hand.
1 each 23 x 8, 10, 12 Engine Lathes, new.
1 each 52-in. and 82-in. Radia Drills, new.
1 each 20 in. "Lever" and "Wheel" and Lever" Drills, new.
1 Baker Bros. Universal Saw Bench, new. [new.

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Fitchburg Machine Co. Vertical Automatic Engine, cylinder 14 in. x 14 in. A large variety of second-hand Steam Boiler Feed and Tank Pumps. F. McSWEGAN & SONS, Dover St. and Franklin Square, N. Y.

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"One touch of nature makes the whole world kin,"

Even to the 99th degree,

And we invite YOU ALL, when purchasing tickets to the

COLUMBIAN EXHIBITION,

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And when you have visited the

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both of which are to be seen in the
QUAKER CITY,

Come round to our office, within three blocks of the above attractions, and let us have a friendly talk about machinery.

We are Manufacturers' Special Agents, and can save you money on any machinery purchase

**For Motive Power,
For Iron Working,
or for Wood Working,**

And verily, when we have reasoned with you, and you have returned to your several homes, you will say each unto his wife, "My trip hath not been unprofitable."

Pennsylvania Machine Co., Ltd.,

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3 Upright Corliss Boilers, 150 H.-P. each.
1 Locomotive Fire Box Boiler, 50 H.-P.
1 16 x 36 in. Slide Valve Engine.
1 14 x 42 Greene Engine.
1 16 x 42 Babcox & Wilcox.

Large assortment of Knowles, Blake and Worthington Steam Pumps. Write for prices and full description to

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I offer 3 20 in. x 24 in. Improved Straight-line Ingersoll-Sergeant Air Compressors,

built in 1890, and used only seven months at St. Clair Tunnel. Ready for delivery and in first-class condition.

1 24 in. x 60 in. Left-hand Harris-Corliss Engine. May be seen running

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Great Bargains

Must be Sold and
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16 in. x 30 in. Horizontal Engine.
18 in. x 36 in. Horizontal Engine.
24 in. x 36 in. Horizontal Engine.
19½ in. x 48 in. Beam Engine, with
Knowles Condenser.

Write us for what you want.

LOVEGROVE & CO.,
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SECOND-HAND MACHINERY.

One Pond Machine Tool Co. Iron Planer, 40 in. x 40 in. x 24 ft., with two heads. In fine order.
One Belden 100-lb. Upright Power Hammer.
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One American Tool Co. No. 2 Cabinet Turret Lathe, with slide rest. In fine order.
One Pratt & Whitney 36-in. Gap Chucking Lathe.
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One Iron Planer, 52 in. x 44 in. x 12 ft., with two (2) heads.
Send for circular of Second-hand Machinery in stock.

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SCREW CUTTING LATHES.
1 15 in. x 8 ft. Jones & Lamson, rise and fall rest. Good order.
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MISCELLANEOUS.
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1 No. 1 Brown & S. Universal Grinder. A1 order.
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700 New and Second hand Tools in stock. Write for complete list, photographs and prices.

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AIR COMPRESSOR FOR SALE.

A duplex steam driven Knowles Air Compressor; air cylinders 10 in. x 12 in., steam 8 in. x 12 in. Absolutely as good as new in every particular. Been used very little. Change of oil fuel system reason for selling. Address

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Contractors' Outfits

Twenty 36-in. gauge Rotary Dump Cars.
Two 36-in. gauge Saddle Tank Locomotives.
Three standard gauge Saddle Tank Locomotives.
Ten standard gauge four-wheel Flat Cars,
Four Steam Drills, with tripods and steels.
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Ten Hoisting Engines, various sizes.
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One 30 in. x 30 ft. Cylinder Boiler, extra fine.
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Send for catalogue of bargains.

THOS. P. CONARD,
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ENGINES FOR SALE.

30 x 60 Harriss Corliss. 50-ton wheel.
24 x 36 Babcock & Wilcox. 25-ton wheel.
20 x 60 (pair) Harriss Corliss. Wheel 24 ft. x 78 in.
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14 x 18 High Speed Automatic.
12 x 12 " " (Ball).
90 H.-P. Dick & Church Compound.
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Knowles Deep Well Pump; 12 x 24. Steam Cylinder.
Lighthill Surface Condenser. 1500 sq. ft. cooling surface.
Stock list mailed on application.

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SECOND-HAND MACHINERY.

Boring Mill, 10 ft. 4 in. swing, 56 in. under cross rail, table 7 ft. 6 in. in diameter.
Boring Mill, 8 ft. 4 in. swing, 48 in. under cross rail, table 6 ft. 6 in. in diameter, two heads on cross rail.

One 7-ft. **Engine Lathe**, 7 ft. between centers, face plate 6 ft. 3 in. in diameter.

76-in. **Planer**, 13 ft. long; heavy and powerful.

48-in. **Car Wheel Borer**.

Axle Lathe.

Write for photographs and further particulars.

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THE FOLLOWING Second-hand Engines, Boilers and Machinery of the best modern make, guaranteed in perfect condition:

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1 Hendey Shaper, 15 in. stroke, imp. vise; new.
1 30 x 30 x 6 New Haven Planer.
1 14 x 6 Screw Cutting Engine Lathe; new.
1 26-in. Diamond Auto. Knife Grinder, used 1 month.
1 28-in. " Face."
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1 3-Spindle Garvin Drill Press, used 1 month.
12 H.-P. Portable Engine and Boiler on wheels; fair condition.
Also variety of Engines, Boiler Pumps, &c.
And other machinery, new and second hand. Write for prices. **Machinists' Supply Company**, 39, 41 and 43 Central Ave., Rochester, N. Y.

FOR SALE.

One Stationary Double Cylinder Steam Crane, capacity 5 tons.
One Bookwalter Steel Converter, complete.
CHICAGO HORSE SHOE CO., E. Chicago, Ind.

CORLISS,

Wright, Porter-Allen, Buckeye and Slide Valve Engines, Boilers, Pumps, &c.

2 80 x 72 Corliss Engines. 1 11 x 20 Buckeye Engine.
3 30 x 60 Corliss Engine. 1 14 x 28 Buckeye Engine.
1 26 x 60 Corliss Engine. 1 22 x 48 Buckeye Engine.
2 36 x 48 Corliss Engine. 1 14 x 90 Porter-Allen Eng.
1 28 x 36 Corliss Engine. 1 11 x 16 Porter-Allen Eng.
1 16 x 36 Corliss Engine. 1 9 1/2 x 12 Armstrong & Sons Eng.
1 14 x 36 Corliss Engine. 1 8 x 10 Valley Mch Co. Engine.
1 12 x 42 Corliss Engine. 1 8 x 10 Valley Mch Co. Engine.
1 12 x 48 Corliss Engine. 1 8 x 10 Valley Mch Co. Engine.
1 12 x 54 Corliss Engine. 1 8 x 10 Valley Mch Co. Engine.
1 12 x 60 Corliss Engine. 1 8 x 10 Valley Mch Co. Engine.
1 12 x 72 Corliss Engine. 1 8 x 10 Valley Mch Co. Engine.
1 12 x 72 Niagara Pump. 1 12 x 20 Cummer Engines.
1 8 x 8 x 12 Niagara Pump. 1 18 x 30 Slide Valve Eng.
2 Centrifugal Pumps. 1 17 x 42 Slide Valve Eng.
1 No. 2 Gould & Garrison Pump. 1 16 x 36 Slide Valve Eng.
1 Deepwell Pump, 7 x 10 cyl. 1 14 x 18 Slide Valve Eng.
1 50 in. Corn Mill and 1 11 x 0 Slide Valve Eng.
Emery Grinder. 2 20 x 18 Wright Engines.
1 Corliss Condenser, 600. 100 ft. of 7-in. wrought-iron pipe.
2 Bulkley Condensers, 500. 1 Bogardus Mill.
1 Blake Crusher, 10 x 7. 1 Sawdust Feeder.
1 6 1/2 ft. x 14 ft. Tubular Boiler. 1 Boiler Iron Tanks.
1 80 H.-P. Marine Boiler. 1 Logging Locomotive.
1 Brennan Crusher, 8 x 25. 1 18 x 25 Vertical Engine.
2 Platform Scales. 1 Duplex Fire Pump.

G. M. CLAPP, 74 Cortlandt St., New York.

FOR SALE.

BAKER BLOWERS, Nos. 1, 3, 4, 4 1/2, 5, 6 and 7
ROOT BLOWERS, Nos. 2, 3, 4, 5, 6 and 7.

Sturtevant & Evans, Nos. 5, 7 and 8.
2 12 and 1 12 H.-P. Horizontal Boilers; new very cheap. 10 in. x 7 in. Blake Crusher; equal new. Corliss Engine, bar wheel in halves, 15 ft. x 24 in. x 9 in. hole. 1 large Alexander & Boschert Press. 1 Niagara Fly Wheel Pump, 14 in. x 10 in. x 10 in., brass lined. Purchasers of machinery and those who have it for sale will do well to correspond with C. R. BIGELOW, Machinery Expert and Appraiser, 46 Dey St., New York City.

LARGE ENGINES.

We have for sale cheap:
One 300 H.-P. Cummer Horizontal Engine, complete.
One 250 H.-P. Slide Valve Horizontal Engine, complete.
Must be moved at once. Address
C. W. SCHULTZ & CO.,
308 Walnut St., PHILADELPHIA.

MACHINE TOOLS,

New and Second-hand, For Sale.

Hendey's "Morton" Screw Cutting Lathes. Cut 12 threads without changing any gears. 38 speeds for the side feed. Garvin Screw Machines. Dwight-Slate Sensitive Drills. A line of second-hand Tools, also small Electric Fan Motors.

DANIEL KELLY,
51 N. 7th St., Philadelphia, Pa.

New York Safety Engine, 9 x 12.

Upright Drill, 20-in. swing.

Plain Engine, 12 x 30.

Belt Wheel, 8 ft. diam., 20 in. face, 7 in. bore.

Belt Wheel, 10 ft. diam., 18 in. face, 6 1/2 in. bore; split.

Belt Wheel, 11 ft. diam., 18 in. face, 13 in. bore; split.

Large assortment New and Second-hand Machinery, Shafting, Pulleys, Belting, Tools, Iron, &c.

H. B. BIRTWELL,

343 North 3d St., Philadelphia.

Great Bargain.

A full set of Automatic Cut-off Engine Patterns, with drawings, wood cuts and patent right to manufacture; are almost new, and were made by the finest workmen. If sold at once will let them go at a sacrifice. Address office of **The Iron Age**, 96-102 Reade street, New York.

FOR SALE.

2 5 H.-P. Gas Engines.
1 "O" Knowles Pump.
1 7 x 20 Lathe.
1 Boiler Upright, 24 x 72.
10 New Road Scrapers.
1 Pair Coriolis Rolls, good as new.
2 Lewis Bolt Headers.
1 Alligator Shear.

H. H. MANSFIELD, 126 Liberty St., New York.

GREAT BARGAINS

In "Otto" Gas Engines.

2 Horse-power \$250
4 Horse-power 380
7 Horse-power 450

OTTO GAS ENGINE WORKS,
38d and Walnut Sts., Philadelphia.

MACHINERY,

NEW AND SECOND-HAND, FOR SALE.

LATHES.

80 in. x 18 ft., Geared Face Plate.
 60 in. x 45 ft., " " Double Lathe, complete.
 52 in. x 35 ft., Bed Feed only; one end has Hor. Boring Machine.
 48 in. x 27 ft., cheap.
 88 in. x 18 ft., Geared Face Plate.
 88 in. x 27 ft.
 80 in. x 28 ft., Shafting
 Lathe, Pond.
 28 in. x 22 ft., cheap.
 24 in. x 10 ft.
 24 in. x 4 ft., A1.

PLANERS, SHAPERS, SLOTTERS.

8 ft. x 15 in. 7 ft. x 28 in. 9, 12, 15, 16 in. stroke
 4 ft. x 20 in. 7 ft. x 30 in. Shapers.
 5 ft. x 22 in. 8 ft. x 31 in. 15, 20, 24 in. stroke
 5 ft. x 24 in. 12 ft. x 34 in. Shapers.
 8 ft. x 24 in. 18 ft. x 42 in. 8, 12 in. stroke Slot-
 5 ft. x 26 in. 22 ft. x 62 in. ters.
 5 ft. x 29 in. 24 ft. x 54 in.
 Lincoln Millers Gang D-ills, Screw Machines.
 Steam Hammers, 100, 150, 1600 and 3000 lbs.
 Drill Presses, 20, 21, 23, 28, 30, 44 in., Upright.
 Bolt Cutters, 14, 15 in.
 Flanging Machine, O'Brien Pat., for Circular
 Boiler Heads.
 Gear Molding Machine, Scott's Pat., 3 different sizes.
 Bliss Punching Press, No. 75.
 Corliss Engines, 12 in. x 24 in., 14 in. x 36 in., and 16
 in. x 42 in.
 Brown Engine, 18 in. x 48 in. Whitehill, 11 in. x 18 in.
 Vertical Engine, 13 in. x 16 in., N. Y. Safety Steam
 Power Co.
 Send for latest list.

GEO. PLACE MACHINE CO.,

120 Broadway, New York.

FOR SALE.

One 16 in. x 24 in. Standard Gauge Locomotive.
 One 15 in. x 20 in. Standard Gauge Locomotive.
 Three 7 in. x 12 in.-36-in. Gauge Locomotives.
 Fire Box Boilers from 15 to 100 horse-power
 in stock; Engines, Boilers, Shears, Hoisting Engi-
 nes, Pile Drivers' and Contractors' Supplies.

THOMAS CARLIN'S SONS,
Allegheny, Pa.**4 BOILERS.**

Four second-hand 75 H.-P. Double-Deck Boilers,
 with all fittings and fixtures. In first-class
 condition. Cheap.
 Two 2-ft. Boilers, 48 in. diam. x 32 ft. long, in
 prime condition. Cheap.
 One 16 x 22 Side Crank Engine.
 One 16 x 36 Side Crank Engine.
 Full line of new and second-hand Boilers and
 Engines always on hand.
 H. M. Sciple & Co., 3d and Arch Sts., Philadelphia, Pa.

FOR SALE.

40,000 pounds Standard Binding Twine.
 6000 " Cotton Rope.
 20,000 " Manilla "
 Will sell cheap.

L. K. HIRSCH,
549 Rookery, Chicago, Ill.

Relaying Rails and Narrow-Gauge Equipment
 and large quantities of Light New Steel Tee
 Rails; For Sale Cheap.

100 tons of "I" Beams, new, 7 to 15 in. and 15
 to 28 in. long.
 I am in the market at all times to buy or sell any-
 thing in the way of second-hand Equipment, Rails,
 and Scrap. In answering, kindly mention paper.

L. K. HIRSCH,
549 Rookery, Chicago, Ill.

STEAM PUMPS
FOR SALE.
 One 6 in. x 4 in. x 6 in. Worthington Pump.
 One 6 in. x 4 in. x 6 in. Smith Vaile Pump.
 One 5 in. x 4 in. x 6 in. Deane Tank Pump.
 One 6 x 3½ x 6 Knowles Pump, and
 Hooker Pumps for every duty.
 Address

HOOKER-COLVILLE STEAM PUMP CO.,
St. Louis, Mo

BARGAIN.**Niles Tool Works Planer.**

To plane 84 in. x 84 in. x 16½ ft.

Two heads on cross rail. Modern heavy ma-
 chine.

GEO. PLACE MACHINE CO.,
120 Broadway, New York.

FOR SALE.

Large lot of Loco. Boilers,
 50 to 100 H.-P., in first-class order.

Can furnish stacks, grates and all
 fittings to suit purchasers.

CHESTER BERTOLETTE & CO.,
Norristown, Pa.

FOR SALE.
PUMPS, ENGINE & BLOWER.

1 Cameron Pump, No. 12 Special.
 2 Guild & Garrison Pumps, No. 3.
 2 Small Pumps.
 1 8 in. x 12 in. Vertical Engine.

1 Dimpfel's Blower, 5 ft. x 20 in.

DAN'L W. RICHARDS & Co.,
86-92 Mangin St., New York.

FOR SALE.

2 Double Deck Boilers about 40 H.-P. each,
 cheap. Hoisting Engine. Cylinder Boilers for
 Stacks, 30, 40 and 42 in. diameter. Round and
 Square Iron Tanks. Book Binding Machinery.
 Smoke Stacks, light and heavy, all sizes. Large
 lot Cast and Wrought Scrap Iron on hand. Also
 Dealers in Metals.

BUSSENIUS & CUNLIFFE,
12th and Washington Ave., Philadelphia.

FOR SALE.
CRANK and GEARED SHAPERS.

Write us for Bargains.

J. STEPTOE & CO., Cincinnati, O.

FOR SALE.

25 lb. section iron T Rails in good con-
 dition for relaying.

WM. H. PERRY & CO.,
Providence, R. I.

FOR SALE, CHEAP.

Eight Steam Cranes, 24 Iron Ore Buck-
 ets, 24 Trucks and 8 Overhead Dump
 Cars, all of which have had very little
 use and are in good condition; can be
 seen in Cleveland.

Andrews, Hitchcock & Co.,
 420 Perry-Payne Building,
 Cleveland, O.

FOR SALE, BARGAIN.

High Speed Automatic Engine.
 1 13 in. x 12 in. cyl. Ball Engine.
 3 10 in. x 12 in. cyl. Valley M. Co. Engines.
 1 16½ in. x 24 in. cyl. Armington & Sims P. S. V.
 1 Eclipse Fly Wheel Steam Pump, 18-in. steam,
 12-in. water, 24-in. stroke, 8-in. suc.

Address
GEO. W. SHANKS,
28 Light St., Baltimore, Md.

SEALED PROPOSALS

for supplying the city of Orange, N. J., with
 5000 feet of Cast Iron Water Pipe, from time
 to time, during the current season, will be
 received up to 5 o'clock P.M. of June 5, 1893, at
 the office of the City Clerk. 1000 feet of 4-inch
 pipe, weight 19 or 20 lbs. per foot, and 4000 feet
 of 6-inch pipe, weight 30 lbs. per foot.

THOMAS DOWD,
 Sup't Orange Water Works,
 New Jersey.

KOKOMO,
INDIANA.

Are you a Manufacturer?

Do you expect to Manufacture?

If you have given the matter
 thorough consideration, you
 have figured the fuel cost as
 one of the important items of
 expense. Come; let us save
 this part of the outlay for you.

Shipping facilities the very best,
 and every point of advantage a
 business man can ask in a hust-
 ling, wide-awake, modern city
 of 15,000 population, in the
 heart of the great Gas belt of
 Indiana. Write for catalogue.
 Address

Kokomo Enterprise Co.,
KOKOMO, IND.

A 16-inch SHAPER

Makers: Gould & Eberhardt.
 Splendid condition; low price; good value.

A 16 in x 8 in. Hendey Lathe.

Used but a short time.
 A splendid tool.
 A good purchase.

The Scranton Supply and Machinery Co.,
Scranton, Pa.

FOR SALE.

Four Cylinder Boilers good for Stacks, 15 ft.
 long, 6 ft. diameter. Address
"BOILER,"
 Office of The Iron Age, 220 South 4th St.,
 Philadelphia, Pa.

WANTED.

Second-hand Steam Alligator
 Shear, to cut old Boiler Iron. Must
 be cheap.

FOR SALE.

10,000 tons Mill Cinder; Philadelphia delivery.
 150 tons Hoop Iron Fagots.
 100 tons No. 1 Wrought Scrap Iron for piling.
 100 tons Old Boiler Iron, rings and sheets.

—ALSO—

75 standard gauge 30,000 lb. capacity Ore Freight
 Cars, cheap.
 2 second-hand narrow gauge (3 ft.) Locomotives.

G. W. SCHULTZ & CO.,
308 Walnut St., Philadelphia.

AUCTION SALE
of Bankrupt Stock of the
FLORENCE TACK CO.

Will be sold at Public Auction, on the premises, at Northampton, Mass., **Wednesday, May 31, 1893**, at 10 o'clock in the forenoon, the following property:

About 45,000 lbs. Tacks and Nails, of all sizes, kinds and description—iron, steel, copper and brass; carpet, upholsterers', miners', trimmers' lace, brush, gimp; basket, trunk, shoe, clout, Hungarian, channel, finishing nails, brads, &c.

About 35,000 lbs. Flat and Round Wire Staples, of all kinds—spring, blind, belt, clinch, fence, nail, ear; poultry netting, wire cloth, clamps, &c.

About 53,000 lbs. Plate Iron; 40,000 lbs. wire, of all kinds, and all in good condition; 40,000 lbs. castings, 5000 lbs. wire rods, 1000 lbs. tool steel and wrought-iron bars, 3 staple machines, 1 nail-ear machine, 2 unfinished staple machines, 1 wire rolling machine, 1 upright drill, 3 Lathes (1 16-in., 1 14-in., 1 roll), 1 press for cutting washers, 4 Fairbanks platform scales, 16 brass beam scales, 5 grindstones, emery wheels and diamonds, wood patterns, 3000 cutting, shipping and hand boxes; 15,000 lbs. paper; paper boxes, labels, watchman's watch, clocks; tools used in shop: safe, office furniture, 2 pyrometers, &c., &c.

The above will be sold as a whole or in lots to suit purchasers. Sale positive. Terms cash.

J. E. CLARK,
Assignee of the Florence Tack Co.
Northampton, Mass., May 8, 1893.

RECEIVER'S SALE.

FORT WAYNE, INDIANA, May 6, 1893.

The stock in trade and good will of the old established Jobbing Carriage and Hardware firm of Coombs & Co. is for sale; said stock consisting of new and well selected goods for the trade, in good condition. Favorable terms will be given to purchasers intending to continue the business, which is well known and may be made very profitable. Copy of the inventory just completed, and the stock, amounting to about \$30,000, will be shown to parties wishing to purchase upon application to the undersigned.

S. C. LUMBARD, Receiver.

FOR SALE OR RENT.

Manufacturing Property.

Having purchased the Auburn Manufacturing Company's plant, with greater facilities for manufacturing carriage forgings, which my increasing trade demands, I offer my former plant for sale or rent, which consists of two-story stone and wood building, 60 x 30, and three-story stone and brick building, 75 x 40. Also forge shop, 22-ft. posts, 150 x 54, with large double windows between each bent. 50 x 30 boiler house. Splendid water power, 11 ft. head. One 6-in. American Turbine.

One 24-in. Little Giant Turbine.
200 ft. 2½ Cold Rolled Iron Shafting.

40 ft. 2½ Cold Rolled Iron Shafting.

60 ft. 2-in. Cold Rolled Iron Shafting.

Furnished with self-oiling boxes. Water wheel governor; 4-ton Buffalo Scales. The premises cover about 2½ acres. Shipping facilities of the best. Located near N. Y. Central and Philadelphia and Reading depots. Will be sold cheap and on easy terms or rented. For particulars address

RICHARD ECCLES, Auburn, N. Y.

WANTED.

Responsible parties to manufacture and sell on royalty, a cheap portable steel or iron **CULVERT BRIDGE**; it is adapted to all small streams, runs, etc., in roads, streets, **RAIL ROADS**, etc.; improved roads is the order of the day; use this bridge, put it below the level of the road, cover it over and thus prevent jarring and wear and tear of vehicles, etc. Apply to

W. A. NICHOLS,
Girard Building, Philadelphia, Pa.

Let Us Handle Your Goods.

Any manufacturer of staple articles can secure profitable representation with us. We will market product advantageously, having agencies in **Chicago, St. Louis, New Orleans** and **San Francisco**, and local salesmen.

UNITED STATES TACK & NAIL CO.,
Office: Room 23, No. 89 Bedford St.,
Boston, Mass.

For Sale, Cheap

500 tons Heavy Cast Scrap.
1500 " Steel Rail, six ft. and over.

500 tons Soft Steel.

100 " I Beams (Iron).

Also 200 tons Old Telegraph Wire for Bundling.

GEO. H. SIBELL & CO.,
62 and 64 Michigan Ave., Chicago, Ill.

For Sale Cheap.

Complete Electro-Plating Plant, with Buffing Lathes; also Screw Press and Foot Presses. Address **BELLAIRE STAMPING CO.**, Harvey, Ill.

ASSIGNEE'S SALE.

Munger-Colton Manufacturing Co.

Public Notice is hereby given pursuant to an order entered in the County Court of Cook County, in the State of Illinois, on the sixth day of May, 1893, in the matter of the estate of the Munger-Colton Manufacturing Company, Insolvent, that I will sell at **Public Auction** in the rooms of said company, at No. 142 Lake St., in the city of Chicago, State of Illinois all the remaining assets of the said Munger-Colton Manufacturing Company, consisting of machinery, tools, patterns, patents, patent rights, manufactured stock on hand and all other assets remaining in my hands as Assignee, as appears from my inventory now on file in said Court. The conditions of the sale are cash in hand at time of purchase. The entire plant to be offered in bulk, and if the inventoried value of said plant is not bid therefor, then the same to be sold in such parts as may be deemed advisable. The sale will be held on the 12th day of June, 1893, at two o'clock sharp in the afternoon. The plant is now open for inspection, and any inquiries regarding the same that may be addressed to me will be answered.

EDWIN F. GETCHELL, Assignee,
Home Insurance Building, Chicago, Ills.

FOR SALE AT ROCKAWAY, N. J.

A valuable Mill Property in first-class condition, on the line of the D. L. & W. and N. J. Central Railroads, containing 14 acres of land, water and steam power, two turbine wheels, one large Mill suitable for axe or machinery works, three new two-story blacksmith, machine and pattern shops, three dwellings, dynamo and other buildings. The water is pure and suitable for silk or paper factories or dye works. Apply to W. A. TORREY, 6 Wall St., New York.

FOR SALE.

One pair large heavy Plate Steel Pyramid Rolls, 9 in. x 100 in. inside the housings. New and never been used.

P. O. BOX 254, Pittsburgh, Pa.

WANTED.

Foundry Contracts to be completed before September 1st. Capacity of works, 9 tons per day. Can make close prices and prompt shipment.

FRANK C. PATTEN CO.,
Sycamore, Ill.

Any Company

contemplating the expenditure of a large amount in the establishment of a manufacturing industry, requiring the use of a thoroughly equipped Machine Shop, Boiler Shop, Foundry and Smith Shop plant, well located on competing trunk lines of railroads and in a good market, is invited to address

STIMSON, WILLIAMS & CO.,
Bryant Building, 55 Liberty St., New York.

FOR SALE.

A Plumbers' and Engineers' Supply Business in a large Western New York city. Business has been established four years and has increased rapidly. A large wholesale as well as retail business may be done. Address

"PLUMBERS' & ENGINEERS' SUPPLIES,"
office of *The Iron Age*, 96-102 Reade St., N. Y.

Hardware Business For Sale.

Old established Builders' Hardware and Factory Supply trade for sale. A rare opportunity for a bright, active man. Address

"FACTORY SUPPLIES," Box 518,
office of *The Iron Age*, 96-102 Reade Street, New York.

TO LEASE ON THE MOST FAVORABLE TERMS.

An old established and successful Brass, Copper and German Silver Rolling Mill, now in operation and excellent condition, with steam and also water power. Sickness of owner only cause for leasing; no reasonable offer by reliable party will be refused. Call or address

J. A. BEECHER,
Prudential Building, Newark, N. J.

Advertiser,

who is actively engaged in **Iron and Steel business**, intends visiting Europe this summer. Solicits commissions from firms in United States. Is thoroughly acquainted with business on both sides of Atlantic. Address

"EUROPE,"

office of *The Iron Age*, 96-102 Reade St., N. Y.

WANTED.

A second-hand Electric or Gas Engine for freight elevator, with or without car.

CHAS. WEILAND,
143 Chambers St., New York City.

Any Manufacturer

of Hardware or Machinists' Specialties desiring to be represented in New York City and vicinity, will find it to his interest to address

E. J. HUSSEY & CO.,

86 John St., New York.

We are centrally located, active workers and can furnish best of references.

EUGENE BISSELL, Auctioneer.

HAYDOCK & BISSELL
Successors to
ROBERT R. HAYDOCK & CO. and E. BISSELL & CO.

WHOLESALE

HARDWARE AUCTIONEERS,
12 Murray St. and 15 Park Place, N. Y.
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

FOR SALE.

In a flourishing Western city of 25,000 inhabitants, an old established Hardware business Stock will invoice in the neighborhood of \$8000, and consists of builders' and general line of hardware, stoves, crockery, cutlery and house-furnishing goods—a neat and clean stock well assorted. A rare chance, as proprietor wishes to retire from active work. Address

"NEAT AND CLEAN,"

office of *The Iron Age*, 96-102 Reade St., N. Y.

AMERICAN MANUFACTURERS

of Hardware Specialties and Machinists' Too's, who are willing to place the sale of their goods in the hands of an old hardware firm of the highest standing whose salesmen cover the entire United States, will please communicate with

"W. F. & B."

office of *The Iron Age*, 96-102 Reade St., N. Y.

Collections?

ATTENTION! Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Our terms just and fair.

THE HARDWARE BOARD OF TRADE, Ltd.,
4 and 6 Warren street, New York.
JAS. H. GOLDEY, Treas.

CHARLES WEILAND.

I make a special business of buying and selling Job Lots of

HARDWARE AND CUTLERY.

Tools and Second Quality Files a Specialty.

Send for Catalogue.

143 Chambers St., New York.

REMOVAL.

The Frasse Company,
after occupying their old stand at 92 Park Row for upward of 50 years, have removed to 19 Warren St., near Broadway, where they will carry a large and varied assortment of Tools for every branch of the Mechanical Trades. A specialty is their line of Cycle Repairers' Tools. Chesterman Tapes, Stub's Goods and Fischer Files are some of the specialties they sell.

WANTED.

To furnish reasonable estimates on specialties in light metal work.

CLARK & COWLES, Plainville, Conn.,
Manufacturers of Clock Trimmings, Rivets,
Springs &c.

WANTED.

Will purchase good second-hand Foundry Crane, 10 to 15 tons capacity. Give full description, together with photograph if possible, and state price. VALLEY IRON WORKS, Williamsport, Pa.

AGENCY WANTED.

A gentleman born and raised in Pittsburgh, of large business experience and personally acquainted with all the manufacturers in that city and vicinity, is about to open an office in Pittsburgh as Manufacturers' Agent, and would like to communicate with some manufacturers of engines, boilers, cranes, machine tools, or blast furnace operators who desire a representative in that section. Address

"AGENCY,"

office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

I would like to enter

into correspondence with a foundry equipped for small castings and large loam spindle work, having a machine shop fitted to face flanges up to 12 feet diameter. Much paying work can be secured. Address

"LOAM CASTINGS,"

office of *The Iron Age*, 96-102 Reade street, New York.

FOR SALE.

A light Hardware manufacturing business; \$2000 to \$3000 required. Address
"LIGHT HARDWARE,"
office of *The Iron Age*, 96-102 Reade St., N. Y.

Can we interest you in

COLORADO AND WYOMING

lands or deposits of Graphite for paint, facings and bearings; Mica for cutting and lubricants; Mineral Paint—red hematite, ochres and sienna; Magnaestum, Kaolin, Zinc, Oxide of Lead, Sulphur, Borax, Alum, Asphaltum, Iron and Coal?

BARTLEY REESE & CO.,
1332 Curtis St., Denver, Col.

WATER PIPE FOR ORANGE, N. J.

Sealed proposals will be received at the office of the City Clerk up to 5 P.M. of Monday, June 5, 1893, for supplying the city of Orange, N. J., with 5000 feet of C. I. Water Pipe (4-inch and 5-inch pipe, to average 20 and 30 pounds per foot respectively), to be delivered from time to time during the next six (6) months. By order of the Common Council. For particulars apply to THOMAS DOWD, Sup't of Water Works, Dated Orange, May 17, 1893. Orange, N. J.

RECEIVER'S SALE.

Joseph Lautner, having been appointed Receiver at No. 415, December term, 1892, Common Pleas Court No. 1, of the wholesale hardware firm of Joseph Lautner & Co., doing business at Nos. 214, 216 and 218 Ohio St., Allegheny, Pa., now offers for sale the entire stock of the said firm as a whole, consisting of a complete stock of Hardware, Tinware, Wagon Makers' Wood-work, Blacksmith and Carpenter Tools, Builders' Hardware, &c., &c. Address all communications to JOSEPH LAUTNER, Receiver, No. 218 Ohio St., Allegheny, Pa.

Wanted to Manufacture.

One or more Hardware Specialties requiring machine work, on contract, royalty or otherwise. Inventors or others interested, address

"OPPORTUNITY,"

office of *The Iron Age*, 312 The Cuyahoga, Cleveland, Ohio.

A BUSINESS MAN from Europe, now temporarily residing in New York, with first-class New York references, desires to represent an important American house in Europe, where he is well acquainted with the customers in the metal trade. Please address "ACTIVITY," Box 611, office of *The Iron Age*, 96-102 Reade street, New York.

WANTED.

To communicate with parties who desire to sell a patent right for an article that will find sale with the hardware trade; or who desire to have the goods made by contract or on royalty. Address

P. O. BOX 322,

Unionville, Conn.

ATTENTION, CAPITALISTS.

A mechanical engineer, with long years' experience in manufacturing and patentees of a superior automatic Corliss engine, which can be seen in operation, desires to start a new works in the Western States, and invites correspondence from parties who are willing to invest in a solid undertaking. Address

"FAIR INVESTMENT," Box 59,
Indianapolis, Ind.

KEEP BOOKS

by WEST'S New Original-ENTRY LEDGER.

Make the same entry but once. A Ledger in place of a full set of books. Convenient forms for all entries. Easily applied, simple, saves time. West's Self-Proving Balance locates every error. Send 3 cent Stamps for illustrated 16-page pamphlet.

WOLCOTT & WEST, Syracuse, N. Y.

SITUATIONS WANTED.

Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

BY AN EXPERIENCED galvanizer and tinner, a situation as Foreman or to build and start a plant for tinning or galvanizing of any description; thoroughly understands tinning common cast or gray iron and can handle men to good advantage; would take part interest in a small job galvanizing and tinning business. "GALVANIZER 123," office of *The Iron Age*, 96-102 Reade St., N. Y.

EXPERIENCED hardwareman, Als salesman, familiar with bookkeeping, corresponding, traveling now for large factory, wishes position with first class manufacturing concern: Western factory preferred; have acquaintance with the trade; capable of filling any responsible position; best of references. Address "ABILITY," Lock Box 699, Chicago, Ill.

MECHANICAL ENGINEER and Draftsman—Young man, technically educated, desires engagement; several years' practical experience; makes specialty of engine and boiler efficiency trials looking toward best results in steam economy. Address "R. G." office of *The Iron Age*, 59 Dearborn St., Chicago.

AN EXPERIENCED hardwareman, age 44, wants position at once; has been in the business 11 years selling general hardware, fine cutlery and house-furnishing novelties; will give satisfactory reference as to ability and character. Address GEO. S. GEDNEY, 709 N. Sherman St., Bay City, Mich.

CHEMIST with a thorough metallurgical education and large experience in charge of laboratories and metallurgical departments of steel works and blast furnaces is open to an immediate engagement; reasonable permanence of employment more an object than a large salary. Address "IRON METALLURGIST," office of *The Iron Age*, 96-102 Reade St., N. Y.

A MECHANICAL ENGINEER is open for engagement as Superintendent; is expert in designing and production of special automatic machinery and tools, establishing manufacturing processes, organization; good business and mechanical discrimination, &c. Address, in first instance, "CITIZEN," office of *The Iron Age*, 220 So. 4th St., Philadelphia, Pa.

WANTED.—Two or three manufacturers of hardware specialties to represent on commission in Chicago; also those having new goods they wish introduced to the trade. Address "LE R.," office of *The Iron Age*, 59 Dearborn St., Chicago.

BY THOROUGHLY competent Stenographer and Telegraph Operator, with machine; good city references; half-day position preferred. Address "STENOGRAPHER," office of *The Iron Age*, 59 Dearborn St., Chicago.

AS FOREMAN of milling machines or screw machines, by a first-class tool maker who is capable of designing and applying quick labor-saving devices and methods; reference given from similar positions held with some of the best firms in this country (at interview only). Address "MILLING MACHINE EXPERT," office of *The Iron Age*, 96-102 Reade St., N. Y.

AS FOREMAN for foundry, by young man with practical experience; green sand, dry sand and loam, and heavy or light work; can furnish excellent references. Address "HUSTLER," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

AS SUPERINTENDENT; many years' experience in plate, sheet and bar mills (steel or iron); competent to design and erect rolling mills. Address "BAR MILL," office of *The Iron Age*, Rooms 22-24 Pickering Building, Cincinnati.

BUSINESS CHANGES have made the services of an advanced practical supervisory or administrative mechanic available; 30 years' experience in organizing and conducting manufacturing business; fully up in modern methods and all details of systematic duplicate work; large acquaintance; highest references. Address "ADVANCED MECHANIC," office of *The Iron Age*, 96-102 Reade St., New York.

BY A GUIDE MILL ROLLER of over 15 years' experience; can give best of references as to ability and character. Address "N. M. R.," Box 518, office of *The Iron Age*, 96-102 Reade St., New York.

MECHANICAL ENGINEER, now superintendent of a manufacturing establishment, will be at liberty by June 1st to accept a similar position; 15 years' experience in hydraulic and general engineering, wrought iron and steel in construction, transmission of power, &c. Address "TRANSMISSION," office of *The Iron Age*, 96-102 Reade St., New York.

A MAN (32) having had 15 years' experience in Chicago in builders' hardware, tools and house-furnishing goods, speaking American, German and Scandinavian languages, wishes to represent some first-class manufacturer at Chicago and vicinity; would take stock in company if necessary. Address "HARDWARE AGENCY," office of *The Iron Age*, 59 Dearborn St., Chicago.

ORNAMENTAL Pattern Maker, designer and modeler in builders' and cabinet hardware, having had long experience in the manufacture of same; also able to take entire charge of above business; can furnish reference and prove ability to a good company. Address "KOMO," office of *The Iron Age*, 96-102 Reade St., N. Y.

A CHEMIST of extended experience in iron and steel manufacture and copper smelting wants position as chemist or Assistant Manager of blast furnace, steel plant or smelting works of any kind; can burden furnace for product desired; the best of references furnished. Joseph E. HAINES, 3008 Linden Square, Philadelphia, Pa.

PLATE AND SHEET MILL. Manager of many years' experience desires an engagement; can furnish the best of references. Address "PLATE MILL," office of *The Iron Age*, Rooms 22-24 Pickering Building, Cincinnati, O.

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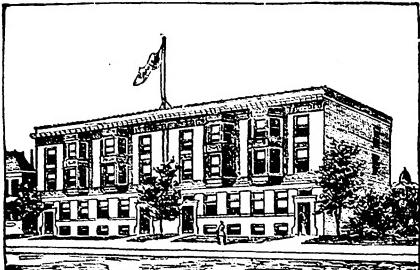
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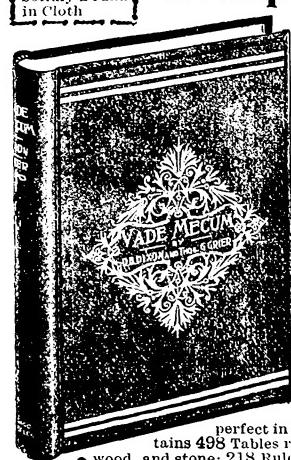
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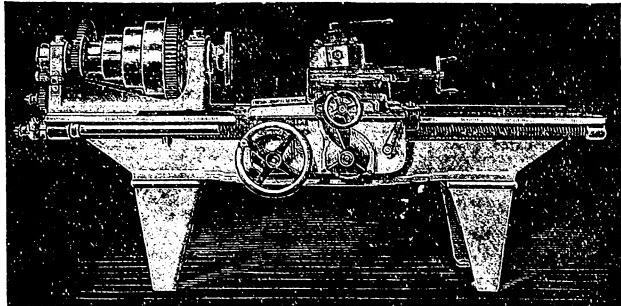
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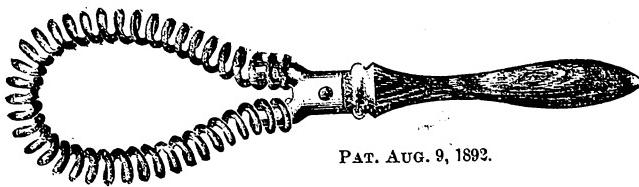
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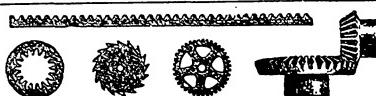
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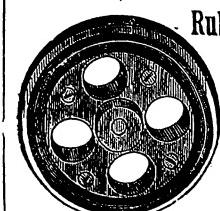
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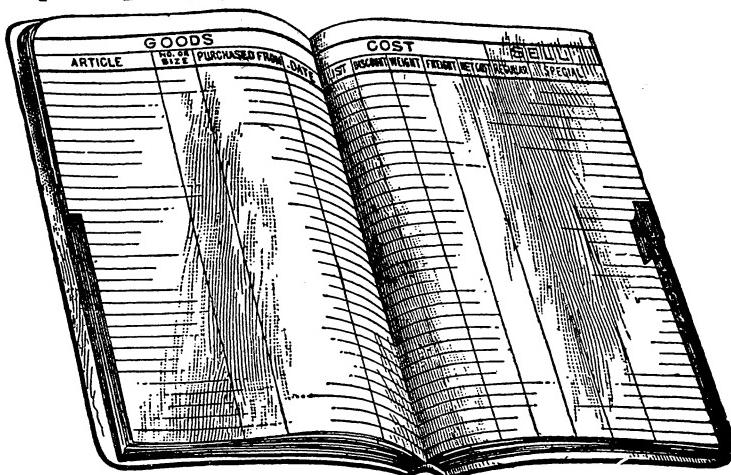
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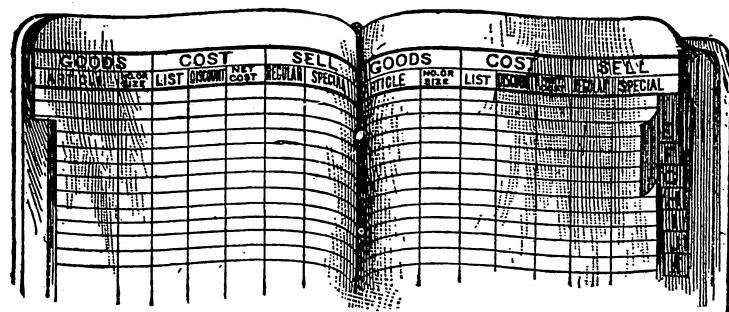
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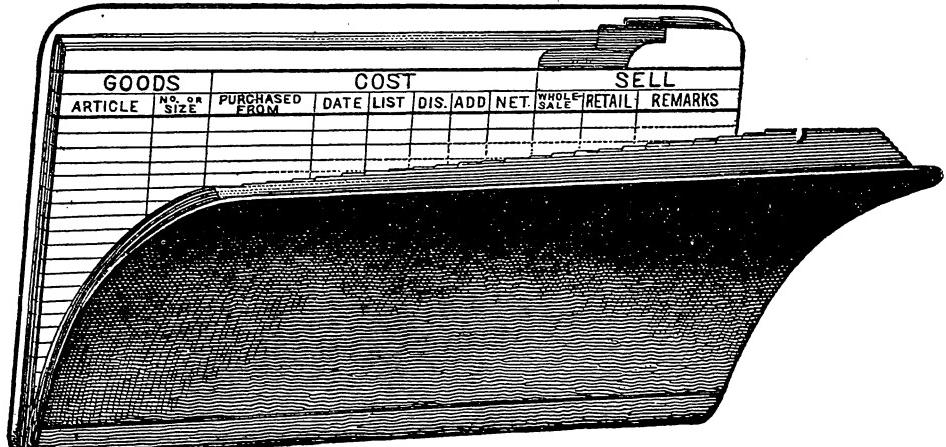
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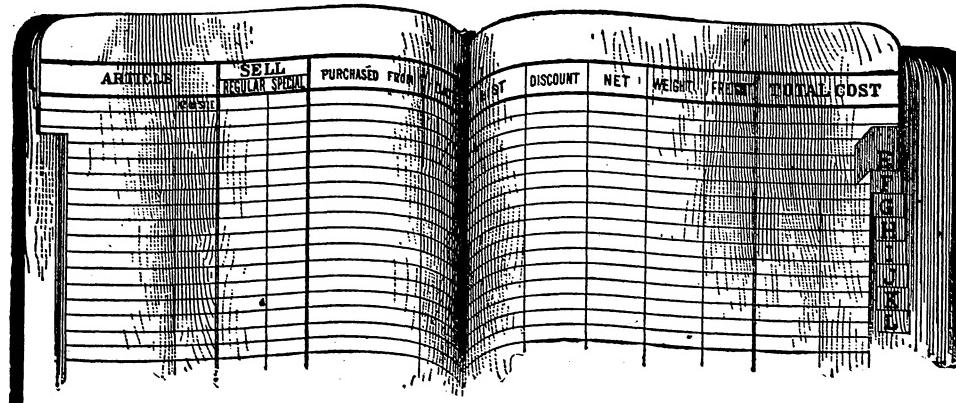
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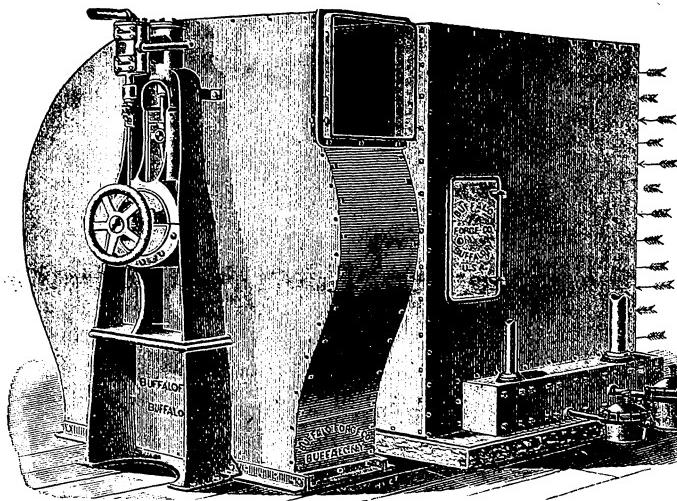
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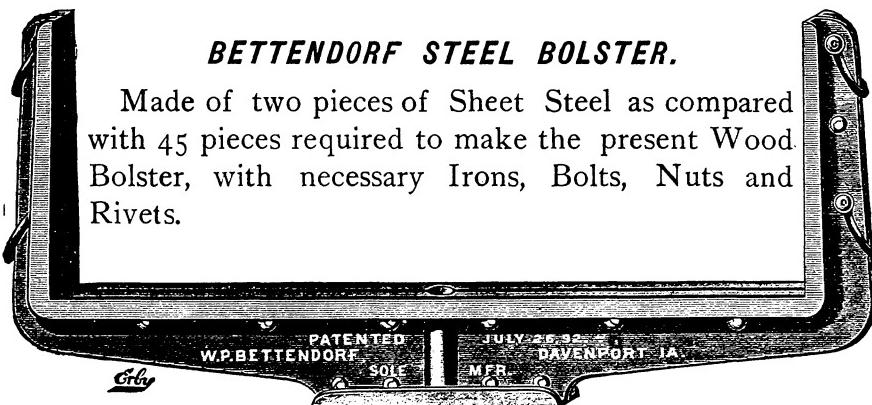
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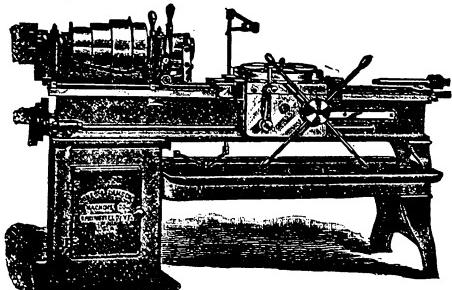
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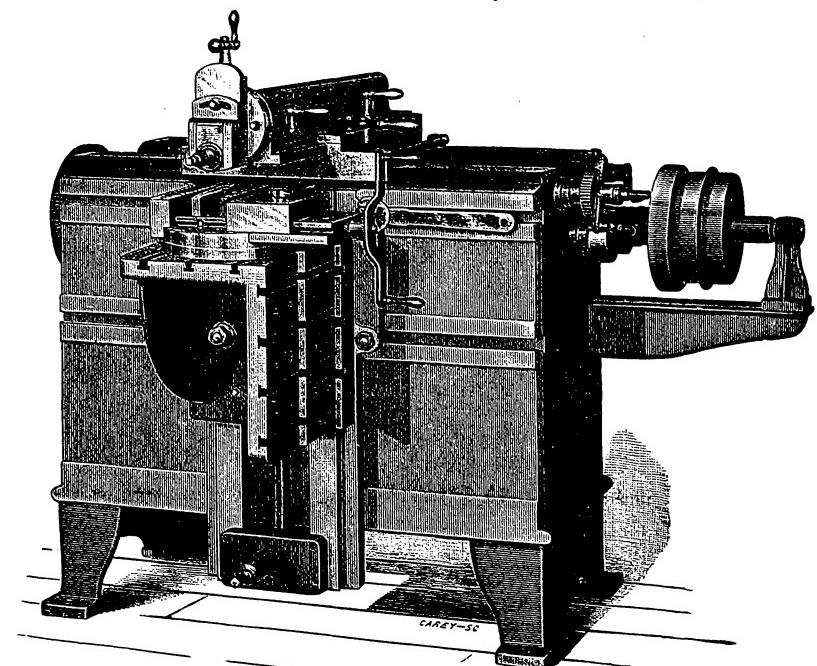
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RESULT:—The Largest Sale of any Freezer on the market

The "Arctic" Best Freezer at a low price ever introduced.

Are You Selling Them? WRITE US.

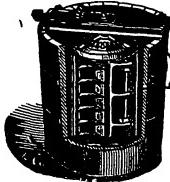
THE WHITE MOUNTAIN FREEZER CO., Nashua, N. H.

THE OLD RELIABLE STANDARD FREEZER

has the reputation of being the **BEST ICE CREAM FREEZER** ever introduced. **STRENGTH, DURABILITY, NEATNESS AND EFFICIENCY** are prominent points in the manufacture. Full Size Can, CEDAR TUB, Detachable Hinged Crossbar, Self-adjusting Vibratory Scraper, etc.

Write for Illustrated Circular, Price-List and Discounts of **STANDARD, EXPERT, MODEL and MACHINE Freezers.**

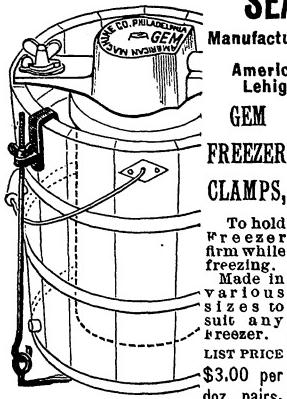
**CHAS. W. PACKER, Mfr.,
20 North Fourth Street, Philadelphia.**



SEASONABLE SPECIALTIES,

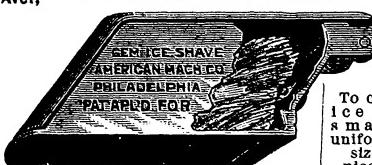
Manufactured by NORTH BROS. MFG. CO.,

American St. and PHILADELPHIA, Pa., U. S. A.



**GEM
FREEZER
CLAMPS,**

To hold Freezer firm while freezing. Made in various sizes to suit any freezer. LIST PRICE \$3.00 per doz. pairs.

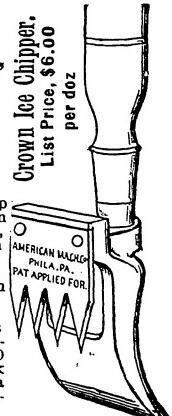


GEM ICE SHAVE.

For shaving ice from block in refrigerator for cooling water, wines, fruits, oysters, &c., and used at Soda Fountains, Restaurants, and Bar Rooms.

List Price, \$6.00 per doz.

Descriptive Circulars, Catalogs and Discou ts to Trade sent on Application.

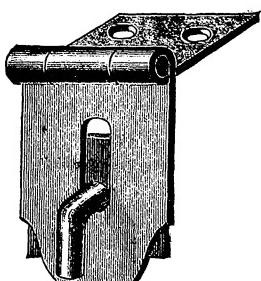


CROWN ICE CHIPPER.
List Price, \$6.00
per doz.

To chip ice in a small, uniform size pieces to use in all Ice Cream Freezers Will reduce a 20 lb. block in a few minutes.

BRONZED STEEL BASKET TRIMMINGS

A Large Assortment.



HASP, $1\frac{1}{4}$ in. Full Size.

Samples and Prices on Application.

THE STANLEY WORKS,

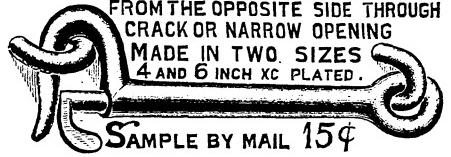


We are always anxious to secure live, responsible agents.

Agents Wanted

Oldest and largest Jobbers of Cycles and Sundries In the U. S. We manufacture, import, and job the most complete line in America, including some 30 styles of new wheels, at unheard of prices. Our superior inducements bring us orders from every State, Territory and large city in the U. S., Canada and Mexico, also ship to Brazil and England. It will pay you to write to us. Prompt shipments guaranteed. Catalogue free. ROUSE, HAZARD & CO., 146 G St., Peoria, Ill.

COVERT'S SELF-LOCKING, GATE AND DOOR HOOK.
POSITIVELY PREVENTS BEING UNHOOKED FROM THE OPPOSITE SIDE THROUGH CRACK OR NARROW OPENING MADE IN TWO SIZES 4 AND 6 INCH XC PLATED.



SAMPLE BY MAIL 15¢

C Plate Staples go with Hook.

We are headquarters for the best Harness Snaps, Leather, Web and Rope Halters, Horse and Cattle Ties; and the most Extensive Manufacturers of Specialties in Saddlery, Coach, and General Hardware in the United States.

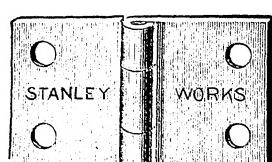
Covert's Saddlery Works,
FARMER, N. Y., U. S. A.



**They Buy
Columbia Bicycles.**

Men who know bicycles always buy Columbias. Why? You know why! Columbias stand by themselves — above all bicycles.

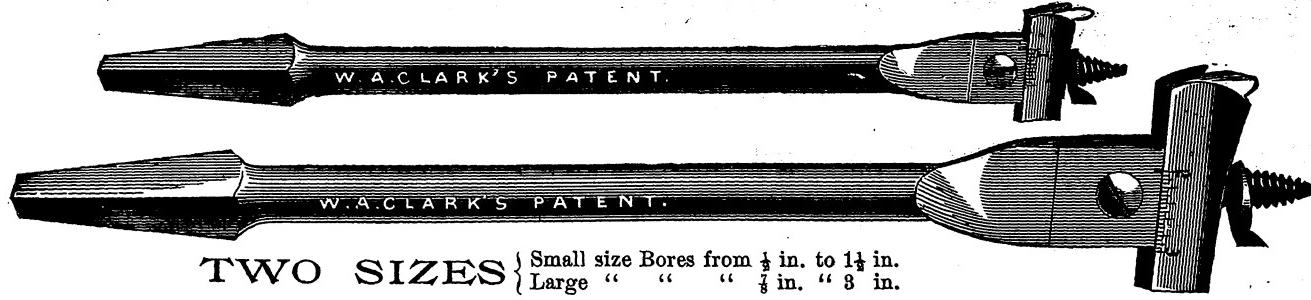
Columbia Catalogue. 45 comprehensive engravings. The most exhaustive cycling catalogue published. Free at Columbia agencies. By mail for two two-cent stamps. Pope Mfg. Co., Boston, New York, Chicago, Hartford.



HINGE. $3\frac{1}{4}$ x $1\frac{1}{4}$ in. Full Size.

New Britain, Conn.
79 Chambers St., New York.

THE WM. A. CLARK PATENT EXPANSIVE BIT.



TWO SIZES { Small size Bores from $\frac{1}{2}$ in. to $1\frac{1}{4}$ in.
Large " " " $\frac{1}{2}$ in. " 3 in.

SPECIAL CUTTERS: No. 5—For Large Bit, Bores from 3 in. to 4 in. No. 6—For Large Bit, Bores from 4 in. to 5 in.

Stock and workmanship superior to all others. Every part interchangeable.

Quality guaranteed. For sale by all Hardware Dealers.

Manufactured by R. H. BROWN & CO., New Haven Conn.

GUNN'S RATCHET AUGER HANDLE.

You have no risk on the quality.
We make only the best!

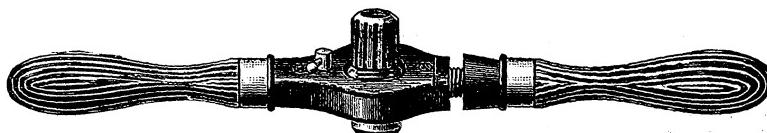


Sand Papers { Flint Paper
Garnet Paper
Emery Paper
Emery Cloth
IN Reams and Rolls

AIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

BAEDER, ADAMSON & CO.

730 MARKET STREET, PHILADELPHIA;
67 BEEKMAN STREET, NEW YORK;
143 MILK STREET, BOSTON;
182 LAKE STREET, CHICAGO.



Since Ratchet Bit Braces came into such general use we have been trying to make a Ratchet Auger Handle which would alike take the place of all other kinds. We have now succeeded in making one which is good enough and cheap enough to meet the demand. It will center and hold auger shanks of nearly every size. It can be shifted instantly to ratchet either way or to remain fixed. In using this handle it is not necessary to change hands. In cramped places one handle may be taken off. It may also be used as a ratchet hand drill.

This handle is made of malleable iron, the working parts being polished and nickel plated. The wooden ends are of second growth ash.

Weight of Handle, 25 ounces.

Price per dozen, \$15.00. Order Gunn's Ratchet Auger Handle No. 5.

MILLERS FALLS CO.,

93 Reade St., NEW YORK.

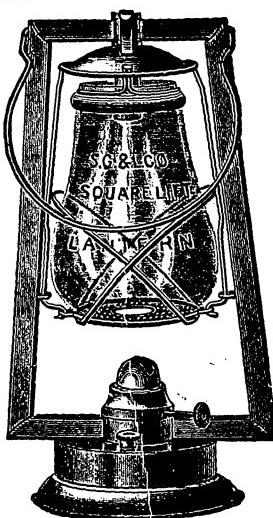


STANDARD Spiral Screw Drivers.

Patented July 3, 1888.

STRONGEST and QUICKEST SCREW DRIVER in the market. One Tempered Steel Bit furnished with each Driver FINELY POLISHED and HEAVILY NICKEL PLATED. Lignum Vitæ Head. LENGTH OVER ALL, 18 inches. Each one in a separate wooden box with slide cover.

Chantrell Tool Company,
Reading, Pa.
JOHN H. GRAHAM & CO.,
General Agents,
113 Chambers St., New York.



Square Lift Wire Lan-
tern. Open.

Steam Gauge AND Lantern Co.

Syracuse, N. Y.

Western Branch: 25 Lake St., Chicago, Ill.

—MANUFACTURERS OF—

Standard Tubular Lamps and Lanterns.

THE BEST IN THE WORLD.

Tubular Lanterns,

Tubular Street Lamps,

Tubular Hanging Lamps,

Tubular Station Lamps,

Tubular Driving Lamps, etc.

THE YALE & TOWNE MFG. COMPANY,

OWNING AND OPERATING

THE YALE LOCK MFG. COMPANY.

THE WESTON CRANE COMPANY.

Lessee, Branford Lock Works.

OFFICE AND WORKS, STAMFORD, CONN.

Ornamental Metal Work, Locks and Builders' Hardware for every purpose.

Catalogues and full information furnished on application at any of our houses.

NEW YORK.

84-86 Chambers Street.

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1120 Market St.

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THE DEALER who sells what
THE PEOPLE ask for

MAKES FRIENDS and MONEY, and
SAVES TIME and TROUBLE.

The people ask for

**LePage's
Liquid
Glue,**

And the people are right.

It is the strongest and best glue made. It has been imitated, but never equalled. Be sure to get what you order and ACCEPT NO SUBSTITUTES.

Our name is on every label

RUSSIA CEMENT CO.,

GLOUCESTER, MASS.

New York Office, 95 Reade and 113 Chambers Streets.
Pacific Coast Office, 23 Davis Street, San Francisco, Cal.

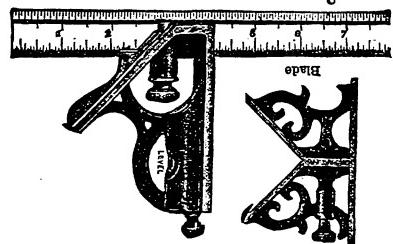
ELIZABETHPORT CORDAGE CO.

Manufacturers of

ROPE AND BINDER TWINE,

46 South Street, New York.

CHAPLIN TRY AND CENTRE SQUARE.



Also a full line of

MACHINISTS' FINE TOOLS.

If you haven't our 1893 catalog send us a postal card.

STANDARD TOOL CO.,

ATHOL, MASS., U. S. A.

ATHOL MACHINE CO., Selling Agents.

JESSE JONES & CO.,

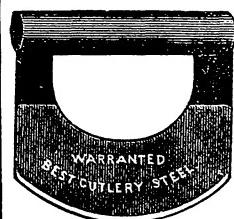
**HARDWARE
SHELF BOXES**

Made of Wood.
No screws or
nails used to work
out and cut
your shelving.

615 Commerce St. Phila.

Send for circular and list of references.

**THE GEM
SOLID STEEL MINCER**



Single

and

Double Blades.

Handle and Blade Formed in one piece.
Always Clean. Indestructible.
No Rivets to Wear Loose.
No Wooden Handle to Shrink, Swell, Loosen,
Split, or Fill with Rancid Grease.

MANUFACTURED BY
PALMER HARDWARE MFG. CO.

TROY, N. Y.

W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY, AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 120.

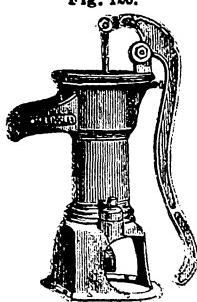


Fig. 76.



or wherever it is desired to raise a large quantity of water by hand power.

The pump has large valves (accessible by hand) and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

Capacity from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.

Fig. 209.

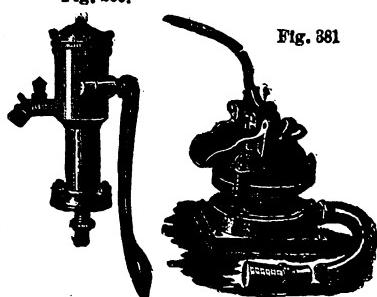
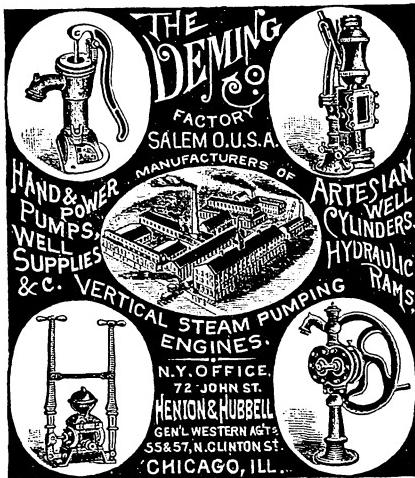


Fig. 381

Send for Circular and Price List.



PEERLESS BRAND PURE MANILA, SISAL AND MIXED BINDER TWINE AND ROPE.

Travers' Mexican Hammocks.

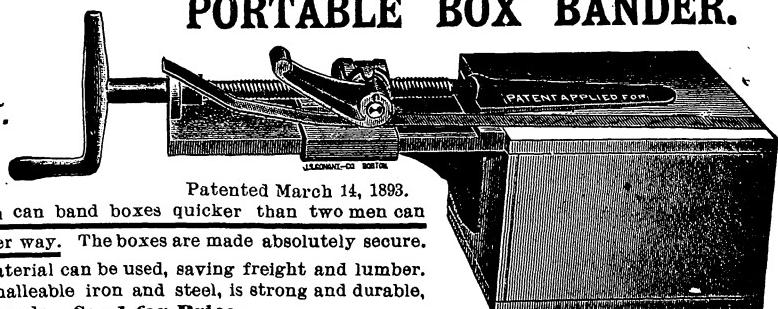
Peerless Sash Cord and Twines.

Purchase your stock direct from the manufacturer.

TRAVERS BROS. CO., 107 Duane St., NEW YORK.

SOON
PAYS
FOR
ITSELF.

PORTABLE BOX BANDER.



Patented March 14, 1893.

One man can band boxes quicker than two men can in any other way. The boxes are made absolutely secure. Lighter material can be used, saving freight and lumber. Made of malleable iron and steel, is strong and durable, weighs 8 pounds. Send for Price.

J. W. GOODELL, Manufacturer,

BURLINGTON, VT.

Lightning Band for Cases AND Crates.

(COVERED BY U. S. LETTERS PATENT.)

Mounted on reels and always ready for use and convenient to handle. Easily and quickly binds shipping cases and crates in a neat, strong and substantial manner.

PRICES :

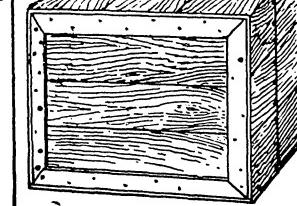
No. 1, per reel of 2000 ft., \$4.50 net.

No. 2, per reel of 2000 ft., \$4.75 net.

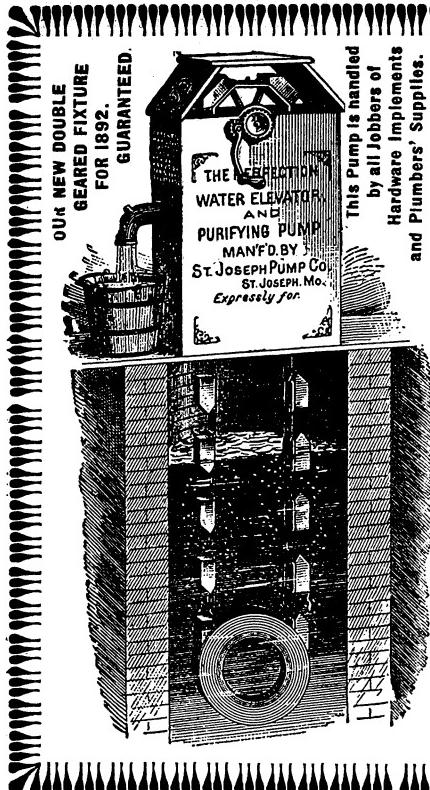
Players for cutting wire, 50 cents extra.

No. 1 for cases under 300 or 400 pounds, and No. 2 for all heavier cases.

Buffalo Specialty Mfg. Co.,
Sole Manufacturers,
Buffalo N. Y., U. S. A.



KOCH PAT. SHIFTABLE
REVERSIBLE
BRACKETS
FOR
SHELVING STORES LIBRARIES (UPBOARD)
&c.
518 MAIN, KOCH A-B-C CO., PEORIA, ILL.



DIRTY CHICAGO

Water, is the complaint of all visitors to the Fair.

Call and see our exhibit in Agricultural Hall, and see the same water, which is so much complained about, made as "clear as a crystal and sparkling as a diamond," by the use of our celebrated

"Perfection Pump,"
made by

ST. JOSEPH PUMP CO.,
ST. JOSEPH, MO., U. S. A.
E. A. KING, Sec'y and Gen'l Manager.

ESTABLISHED 1840.

A WORD TO THE WISE IS SUFFICIENT

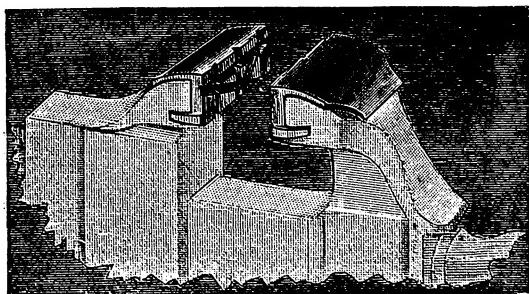
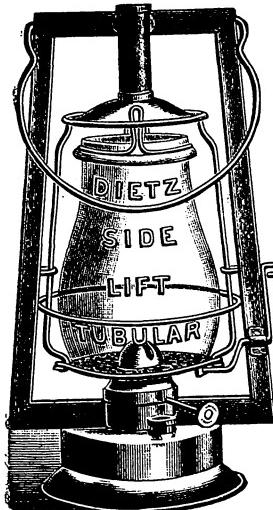
When you purchase a Lantern, Street Lamp or Driving Lamp, remember the

"DIETZ" Make

is the best. Our goods have stood the test of time and are safe and reliable. The name "DIETZ" is plainly stamped on them. Our specialty is Tubular Lanterns, Street Lamps and Driving Lamps. We make a large variety being the oldest and largest house in our line

ASK FOR THEM!

R. E. DIETZ COMPANY,
New York, 60 Laight St. U. S. A. Chicago, 25 Lake St.



BINGHAM PATENT VISE JAW CASE

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3½ inch,	per pair, 40 cents.
4½ "	" 60 "

PRENTISS VISE CO
44 Barclay St., New York

"RELIABLE" Steel Measuring Tapes.

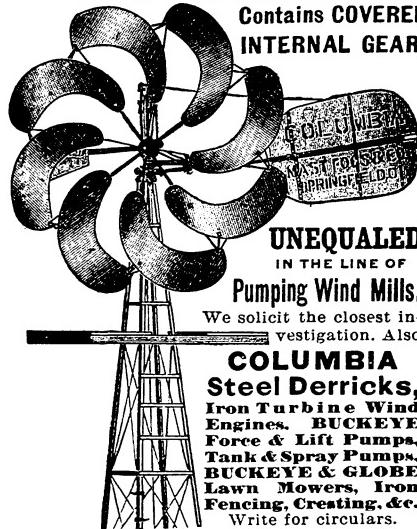
Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval.

LUFKIN RULE CO., Saginaw, Mich.

COLUMBIA STEEL Wind Mill

New in Principle. Beautiful in Appearance.
POWERFUL IN OPERATION.

Contains COVERED INTERNAL GEAR.



UNEQUALLED

IN THE LINE OF

Pumping Wind Mills.

We solicit the closest investigation. Also

COLUMBIA
Steel Derricks,
Iron Turbine Wind
Engines, BUCKEYE
Force & Lift Pumps,
Tank & Spray Pumps,
BUCKEYE & GLOBE
Lawn Mowers, Iron
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Write for circulars.

MAST, FOOS & CO., SPRINGFIELD, O.

NONPAREIL

Ratchet Wrenches.

Made of best forged Tool Steel; are easily and readily adjusted and controlled. Can be made reversible instantly without removing from their work by throwing over the lever in slot of the handle.

The Set of Combination Tools No. 1 includes the wrench, two sockets, one for screw-driver, bit or reamer shank, with wood handle, and one sock-



for drill shank and feed nut. The jaws on this wrench open from 3½ to 14 inches.

Send for Illustrated Circular and Price-list of various sizes

The Keystone Mfg. Co.
312 Terrace, Buffalo, N. Y.

A NEW CHAIN PUMP

KEHLER'S PATENT —
Galvanized Iron Tubing

FOR CHAIN PUMP.

Is guaranteed to be

THE BEST.

IT is made of best quality Galvanized Iron, which will not rust nor accumulate dirt.

IT only weighs one-half pound to the foot, wet or dry, while wood tubing saturated with water weighs six pounds or more per foot.

IT will last longer than wood tubing.

IT will not freeze in any climate.

IT can be attached to any make of curb.

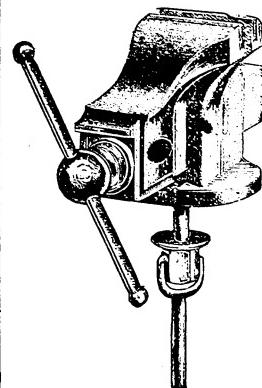
We also manufacture a Galvanized (all) Iron Curb. Address



BELLEVUE PUMP CO.,

Sole Mfrs., BELLEVUE, IOWA.

OR A. F. SHAPLEIGH HDW. CO., St. Louis.
Agents for Southern Territory.



HOLLANDS'
OFFSET JAW
VISE.

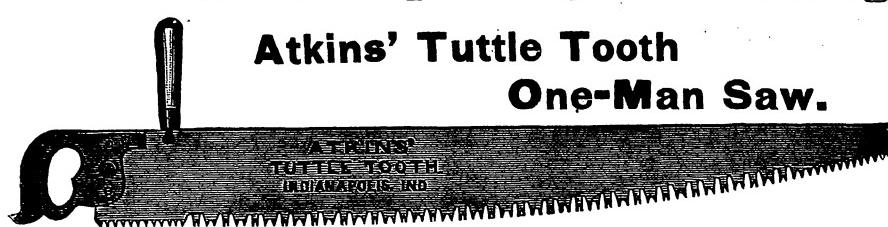
Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

Hollands Mfg. Co.,
ERIE, PA.,
Manufacturers all styles VISES.

E. C. ATKINS & CO., Indianapolis, Indiana.

We make a Specialty of Fine High-Grade Saws.

Atkins' Tuttle Tooth One-Man Saw.



BRANCH HOUSES:

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Minneapolis, Minn.

ATKINS' TUTTLE TOOTH.

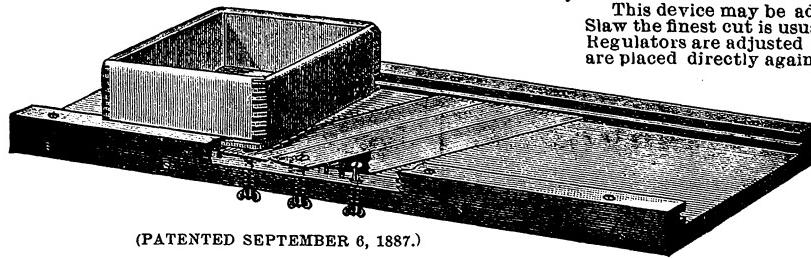
The Original Tuttle Tooth—the Best Saw in the World for the Money.



PATENT ADJUSTABLE KNIFE KRAUT CUTTER.

MANUFACTURED BY

NATIONAL SAW CO., 96 and 98 Reade St., New York.



(PATENTED SEPTEMBER 6, 1887.)

This device may be adjusted to cut fine or coarse, as desired. For cutting Slaw the finest cut is usually the most desirable. To make the finest cut the Wire Regulators are adjusted in line with the Cutter, or in other words, these wires are placed directly against the back edge of the Cutters. To make the coarsest cut, the Regulators are turned until the leg comes against the side strip. If a medium cut is desired, the regulators are turned half way around: thus the desired cut may be obtained by the position of the Regulators. To change the position of the regulators, the bolts passing through the blades are first loosened, the regulators turned to the desired position and the bolts again tightened. To sharpen the blades, take out the retaining bolts, when the blades may be removed; after sharpening, the bolts are replaced, the Regulators adjusted to the desired cut and the bolts tightened.

Three Essentials

IN THE MODERN
CROSS-CUT SAW.

- 1.—Teeth of uniform thickness.
- 2.—Five Gauges taper in middle of blade.
- 3.—Three Gauges heavier on ends than in center of back.

For 10 YEARS the Simonds Crescent-ground Cross-cut Saw (the only Saw on the market possessing these ESSENTIALS) has stood out prominently in contrast with all other makes of cross-cut saws. It has been the CRESCENT-GROUND against the FIELD--MODERN IDEAS against ANCIENT METHODS.

TO-DAY the Crescent-ground Saw is in use in every important lumber camp in the United States. Manufacturers have endeavored to imitate it, but the Machinery producing the Saw, the Process by which it is produced, and THE SAW, are patented. All imitations are but involuntary acknowledgments of the SUPERIORITY of

THE CRESCENT-GROUND CROSS-CUT SAW.

(PATENTED DEC. 28, 1882.)

SIMONDS MFG. CO.,
FITCHBURG, MASS.

CHICAGO, ILL.

SIMONDS SAW CO.,
SAN FRANCISCO, CAL. PORTLAND, ORE.

NEW ADJUSTABLE BENCH LEVEL.

WITH GROUND AND GRADUATED VIAL.

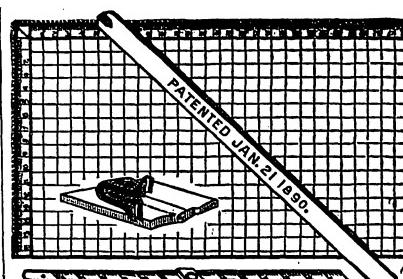
4-6 and 8 inch.



Three Sizes.

MANUFACTURED BY

C. F. RICHARDSON & SON,
ATHOL, MASS.



The Canton Glass Board.

Cuts any Fraction of an inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

—ALSO—

IMPROVED TRAMMEL RULE for Cutting Circles
From 3 inches up to 48 inches, Segments, Gothic Shapes, &c.

Send for Circular.

The Canton Saw Co., Canton, Ohio.

HORACE E. BRITTON, Stoughton, Mass.,

Manufacturer of the HENRY'S PATENT COMBINATION HAFT,

AND OTHER TOOL SPECIALTIES.
The Combination Haft contains six Brad-Awls, one Chisel, Screw Driver, Diamond Point Awl, Marking Awl, Tack Puller and Reamer. Send for Circular and Prices.

Full Set Sent Post-paid on receipt of \$1.00. (No stamps.)

"If you want a Saw it is best to get one with a name on it which has a reputation.
A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

THE SAWS THAT LEAD THEM ALL

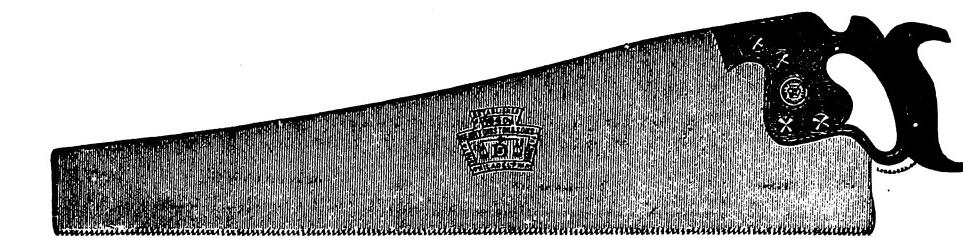
DISSTON & SONS' PATENT D-8 HAND SAW.

" THE
SAW;"
HOW
TO
CHOOSE
IT,
AND
HOW

TO
KEEP
IN
ORDER,

Sent
Free
on
Receipt
of
Name
and
Post Office
Address.

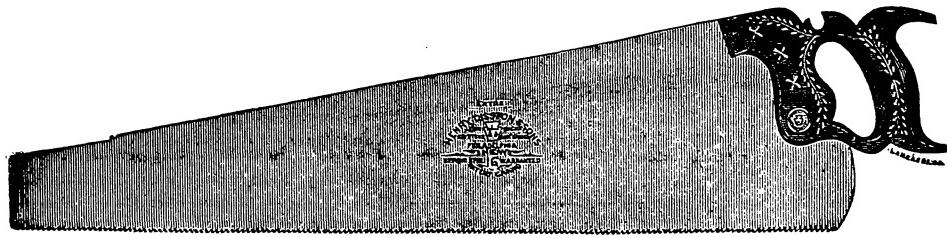
" POCKET
EDITION
OF
THE
SAWYER "
and
" LUMBER-
MAN'S
HAND
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Sent
Free
on
Receipt
of
Name
and
Post Office
Address.



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work ; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

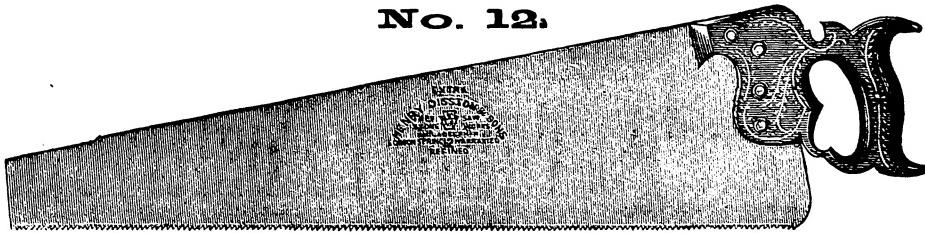
Our New No. 16 Premium Saw.



AN EXTRA FINE SAW IN EVERY RESPECT.

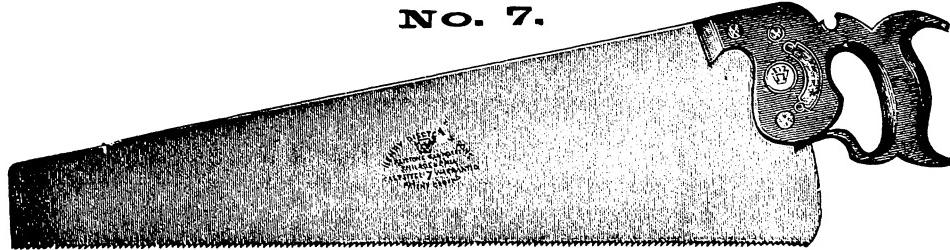
Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

NO. 12.



DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

NO. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

ASK YOUR DEALER TO ORDER THEM FOR YOU.

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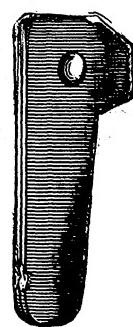
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Spring Cotters.



Flat Spring Keys.



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VARIETIES FILES 3000

THE LARGEST AND MOST COMPLETE FILE WORKS IN THE WORLD.



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Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

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CRUCIBLE
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BANKER & WHITE,

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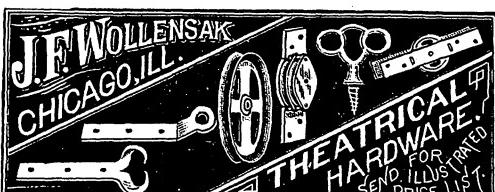
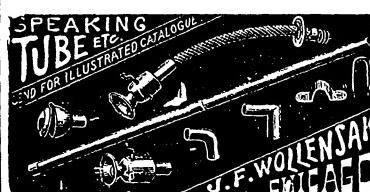
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The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

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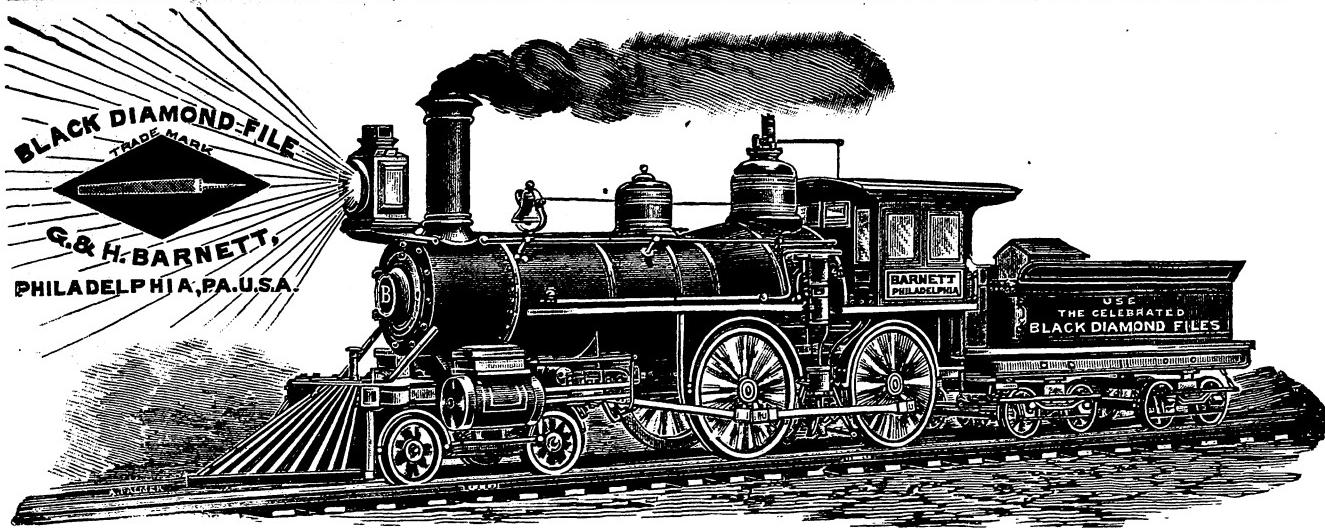


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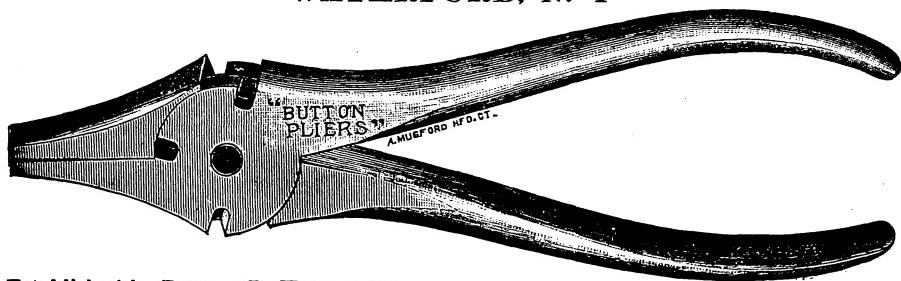
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Specially Adapted for Use on Wire Fence.

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TUCKER'S PATENT FURNITURE CASTER.

Malleable Iron
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The most satisfactory Anti-Friction
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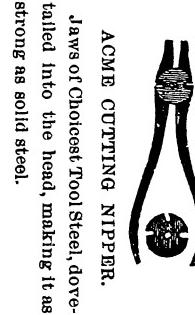
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ACME CUTTING TOOLS.

Made in all Sizes.



SOLID STEEL ACME PLIER
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Made with cutters of best steel.



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Jaws of Choicest Tool Steel, dove-
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Machine Knives, Shear Blades,
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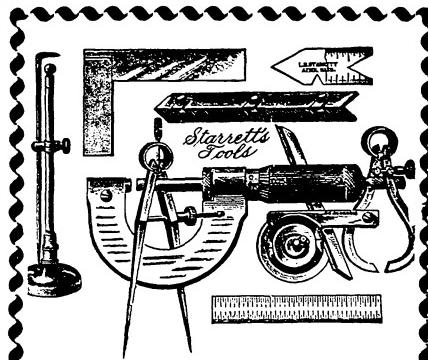
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Have established and maintained their reputation, for superiority,
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H. H. MAYHEW CO., Shelburne Falls, Mass.

The New York Safety Dumb Waiter,
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THE FOX SAFETY RAZOR.

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Is the finest and most practical in the world.

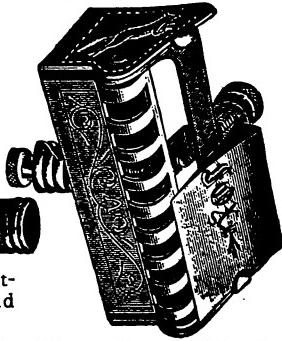
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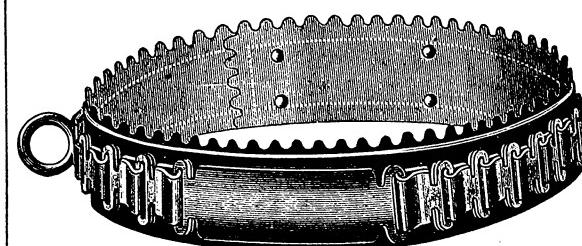
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**HALTER
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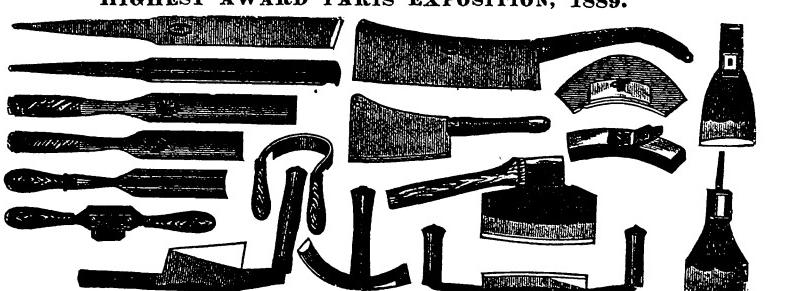
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MANUFACTURERS OF **EDGE TOOLS.**

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FOR THE CORRECT MODE IN SHAVING
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THIS improvement permits CORRECT SHAVING, therefore no irritation is caused, and the most inexperienced can shave with perfect safety.

We also carry the largest line in the United States of CUTLERY of every description.

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Commission Hardware.

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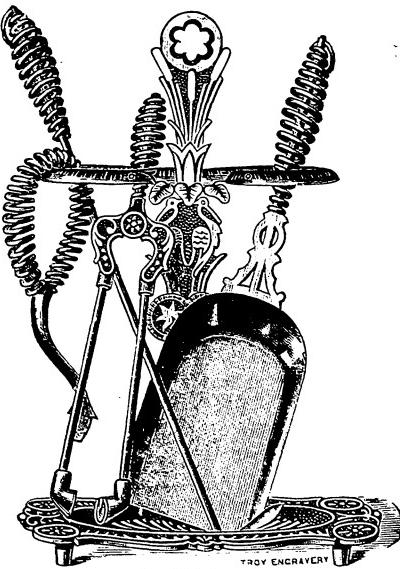
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ALWAYS COLD.

Stove Trimmings.

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Made under Gaitly Patents and only by

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FRANCIS FROST & CO., Toronto, Ont.,
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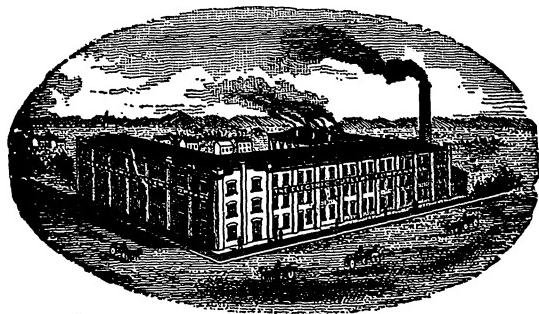
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Knives or Razors,

SEND TO
FRED. B. GURNEY
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The Best Equipped Cutlery Works in the World.



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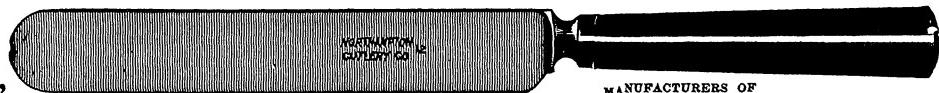
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Edge Tools,
Hammers
AND
Sledges.

Penns. R. R., Tucker and James Sts.,

Manufacturer of



Main Office and Works

Railroad,
Miners'
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B. S. Tools.
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"There is always a First and Best."

It's The Christy

Then, too, there are imitations and counterfeits. Shall we write you concerning the merits of the genuine Christy? Dealers will find it profitable to be posted on these knives.

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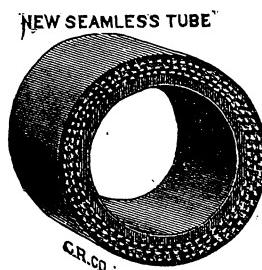
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Sole makers of the celebrated "Maud S."
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Send for full Catalogue and Prices.



SALES OF
Over Two Million Feet

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GARDEN HOSE

alone during the past year,
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single piece complained of,
justifies us in guaranteeing
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Who Has Not Had Bad Hose?

Who has not lost time, patience, money, by attempting settlement for such goods?

THE CAUSE in nine cases out of ten is the lapped seam.
THE REMEDY is in buying our

PATENT SEAMLESS-TUBE HOSE,

made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers' Cotton Hose, &c.

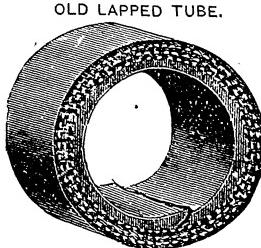
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

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of the Mechanical Rubber Co.,

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Makers of Mechanical Rubber Goods, Clothing, Druggist's Sundries, Specialties, Etc.

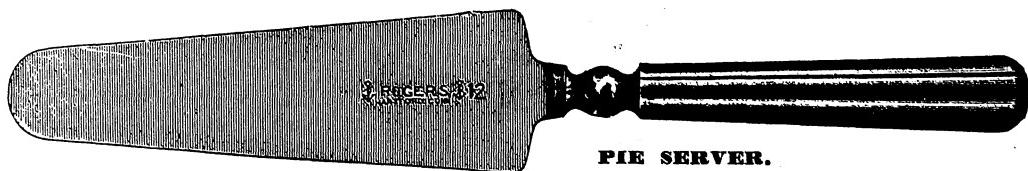


We were awarded an order of
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of our Celebrated
Seamless-Tube
COTTON RUBBER-LINED HOSE.

We Want Your Trade.
Send for 60-page Catalogue.
Write for Prices and Samples.

NONE BETTER

THAN THE

**SILVER PLATED WARE.**

MANUFACTURED BY

THE WM. ROGERS MFG CO.,

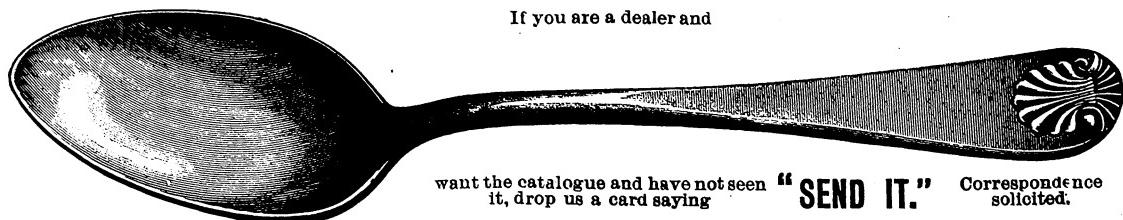
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THEIR MAKE IS EQUAL EAST &
IF NOT SUPERIOR HADDAM & SON
TO ANY OTHER. HAVE BEEN IN BUSINESS SINCE 1840.

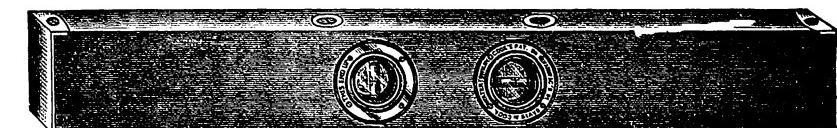
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IF NOT SUPERIOR HADDAM & SON
TO ANY OTHER. HAVE BEEN IN BUSINESS SINCE 1840.

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MOUSE TRAPS
ALWAYS IN STOCK.



THEY DO THE WORK.
Orders solicited. Prices on application.
BURDITT & WILLIAMS,
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**COOK'S PATENT LEVEL.**

Made in Wood and Iron. Every Level Fully Guaranteed.

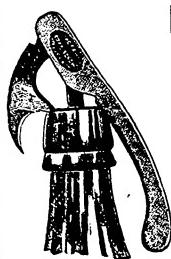
Inquire at your nearest hardware store
for them. If not in stock, send to**DAVIS & COOK,**
WATERTOWN, N. Y.

FIG. 3. Showing Davis cork-screw and fulcrum in position to pull cork.

DETROIT CORK-SCREW CO.,
DETROIT, MICH., U. S. A.

Manufacturers of
The Davis Cork-Screw,
The Davis Knife and Cork-Screw,
The Puddefoot Cork-Screw,
Columbus and Greely
Cork Extractors.

Manufacturers of
Cut Worm
Spiral Screws and
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Cut Worm Cork-Screws
for the Bar Cork Puller

Send for Price-List and Discounts.

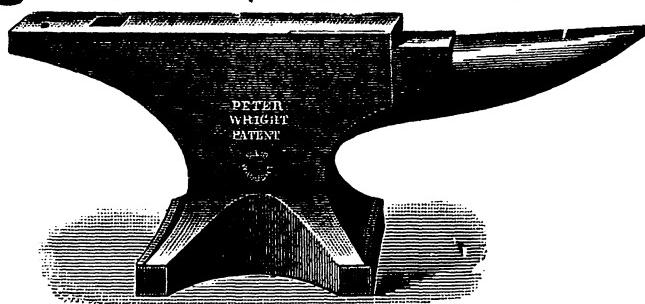


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Cottner's Pat. Dipper and Cup Handle.
Is the handiest thing out. With it a dipper can be made of a common glass, a tea cup, or a granite ware cup. The glass or cup can be securely attached to the handle or removed in a moment. The handle is very durable, and so cheap that they will sell at sight. For sale by all Jobbers. Price \$7.20 per gross. If your jobber cannot supply you, send orders direct to
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Peter Wright's Patent Solid Wrought Anvil

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WRIGHT
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SOLID
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Face-Simile of Trade-Mark.



Face-Simile of Green Label.

By Royal Letters Patent.
V. R.

PETER WRIGHT'S
SOLID WROUGHT
ANVIL
Made of Best Scrap Iron!
THE BICK FACE AND END ALL
IN ONE SOLID PIECE!

You are cautioned in buying to see that each anvil is stamped with the full trade-mark on one side and has the green label affixed to the other.

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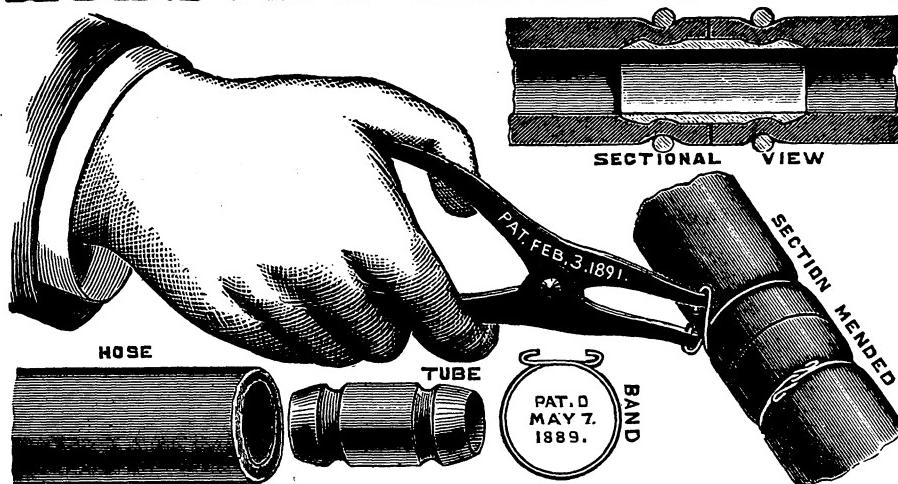
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BRITISH SECTION,
MACHINERY BUILDING.

PETER WRIGHT & SONS, DUDLEY, ENGLAND.

HUDSON'S GARDEN HOSE MENDER.

Put up in Boxes for Family Use.



Each Box Contains 1 Pair Pliers, 6 Tubes, 20 Bands.

Hose can be mended or Couplings fastened on

**CHEAPER,
QUICKER and
MORE SECURELY**

than with any other device.

Screw menders tear the rubber lining from the hose. OURS will not. If you wish to handle a good thing with a good profit, write for circular and prices.

C. E. HUDSON & CO.,
LEOMINSTER, - - - MASS.



outfits, Kennel Chains, &c.; also cut to lengths for manufacturers' use.

The cut represents the exact size of 6/0.

Thirteen Sizes made, 6/0 being the Largest.

**The Bridgeport
Chain Co.'s** Triumph
Chain, made into Halters
Traces, Cow Ties, Tie-

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Warranted Better than the Best

ESTABLISHED 1843.

MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

EAGLE and "FISHER" Stamp.

ENGLISH ANVIL

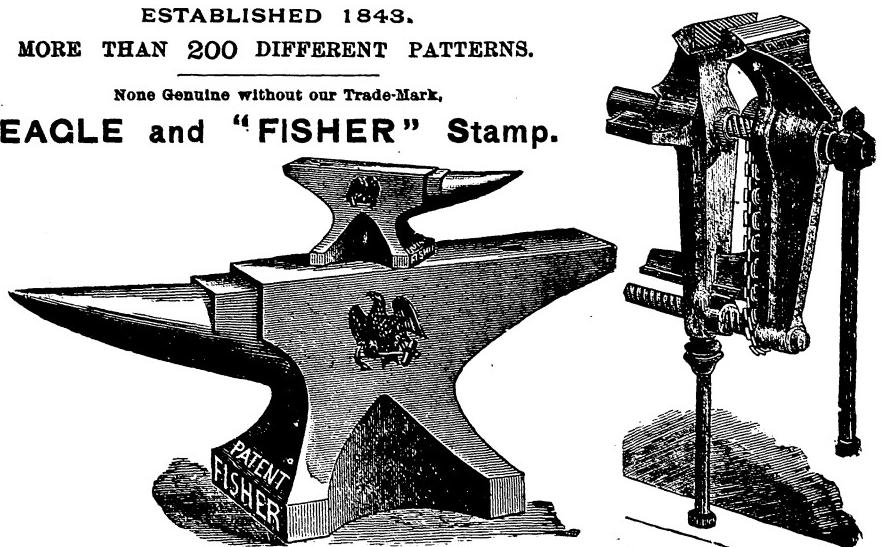
Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough untempered steel, never to break or bend. Only Anvil made in United States fully warranted as above.

FISHER DOUBLE-SCREW VISE

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE. Send for Circular.

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Strongest.
Most Durable.

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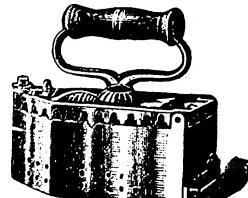
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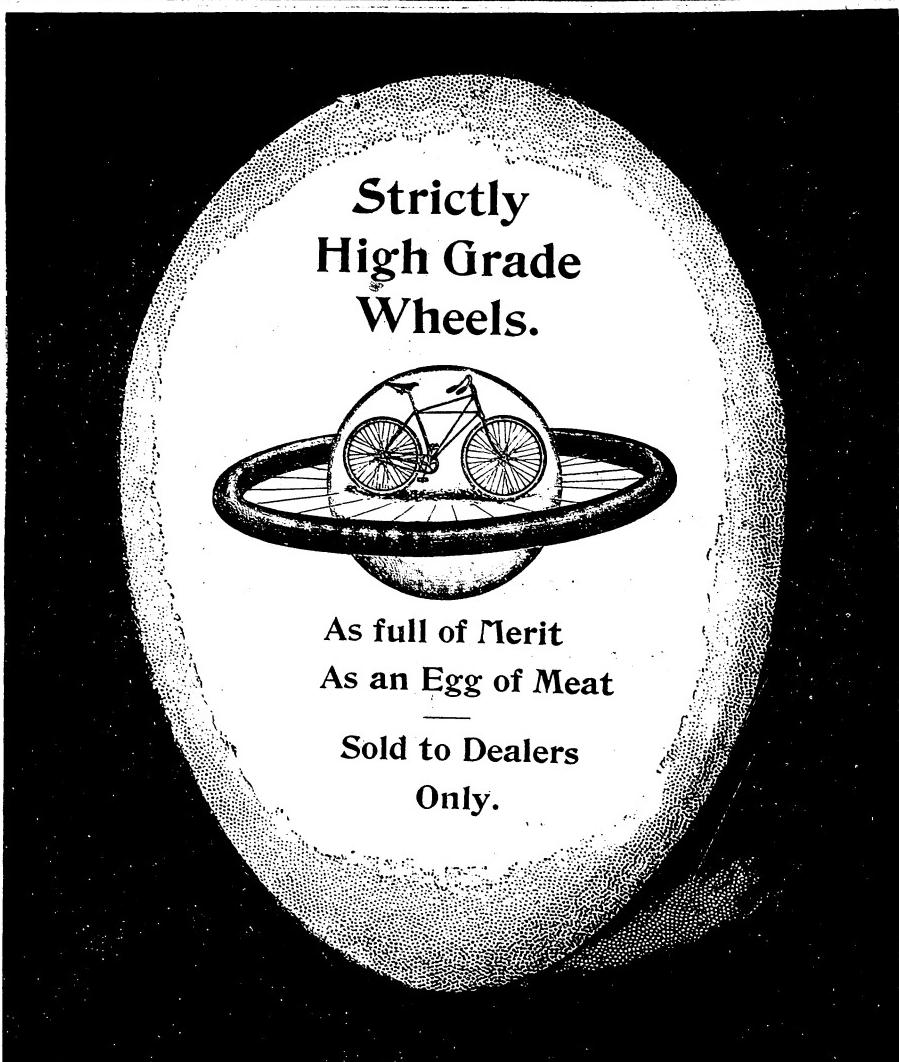
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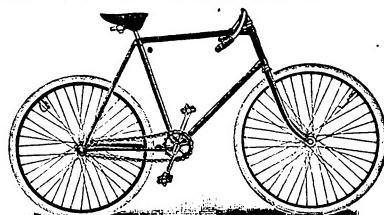
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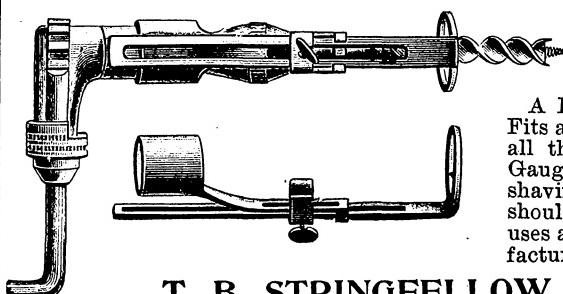
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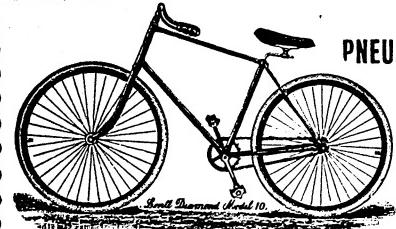
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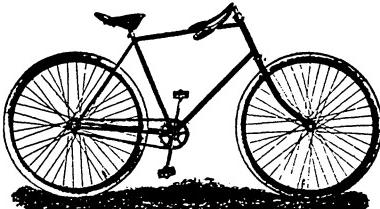
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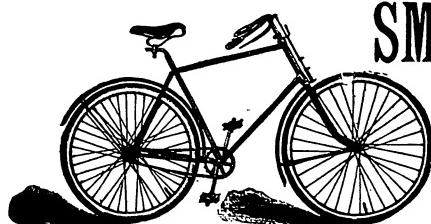
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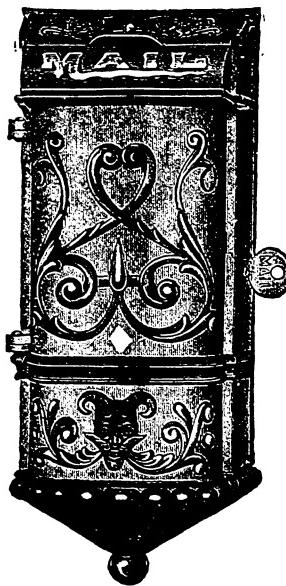
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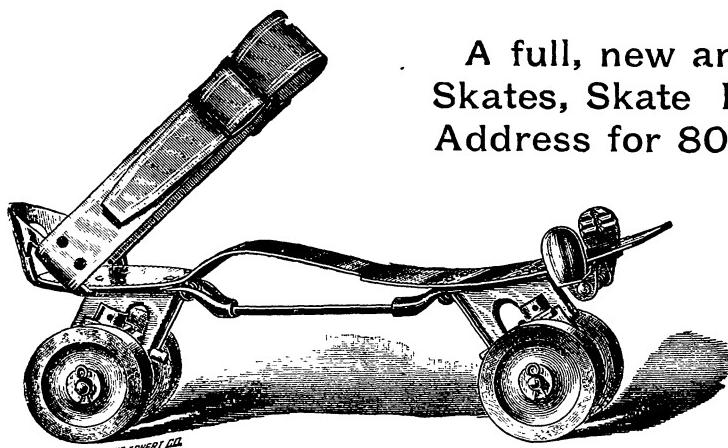
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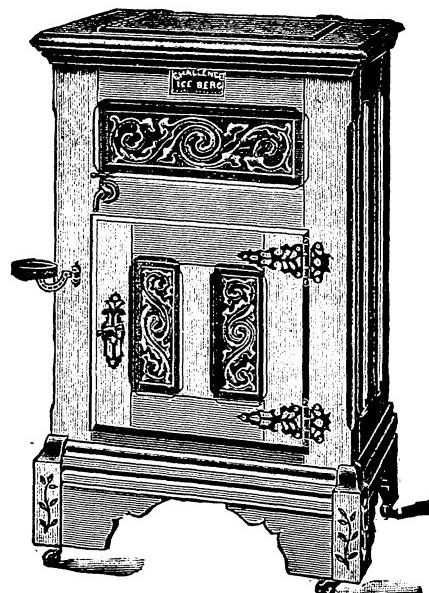
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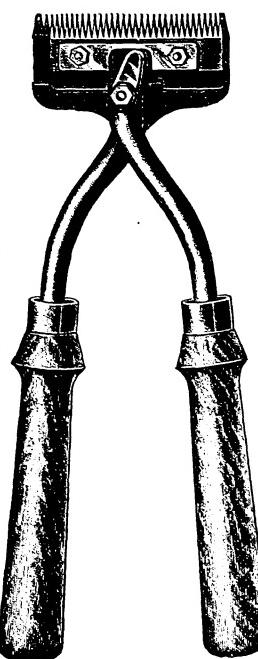
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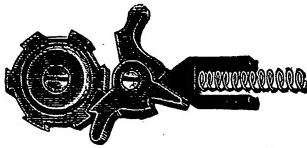
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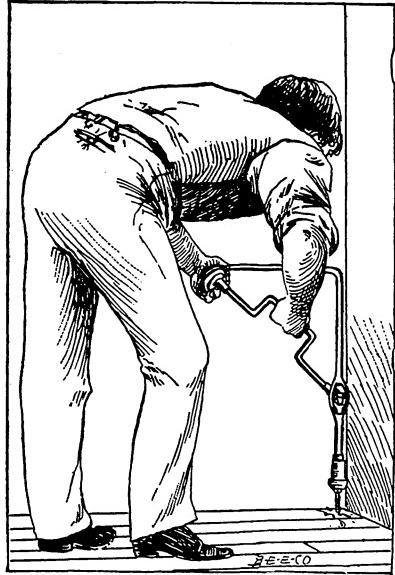
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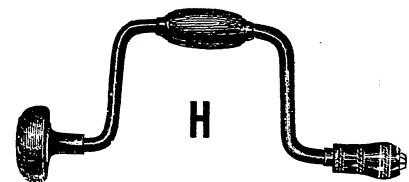
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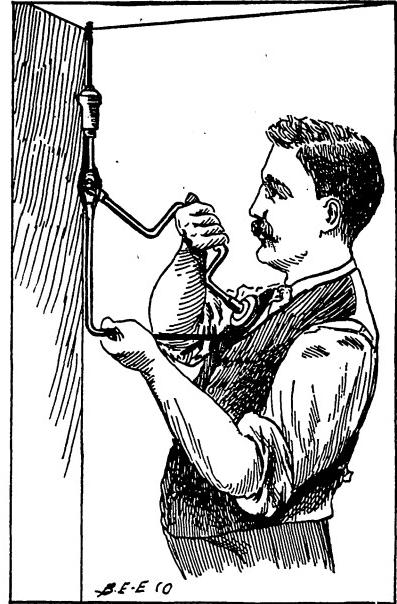
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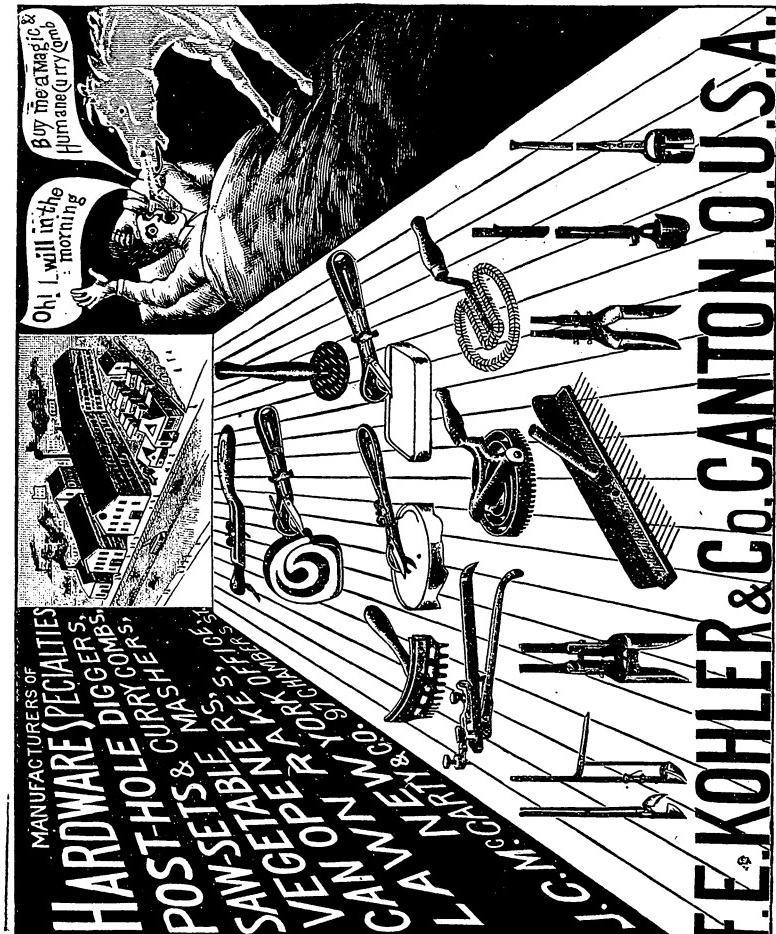
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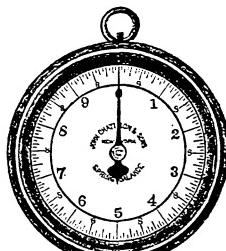
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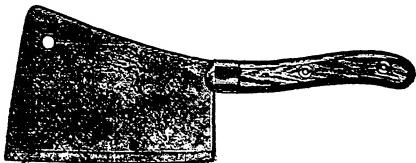
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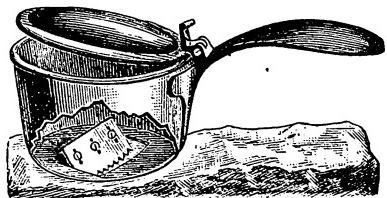
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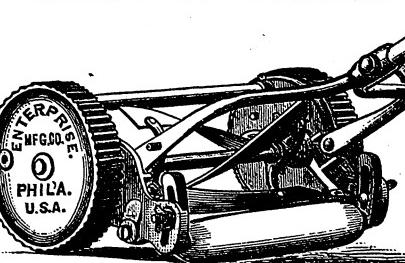
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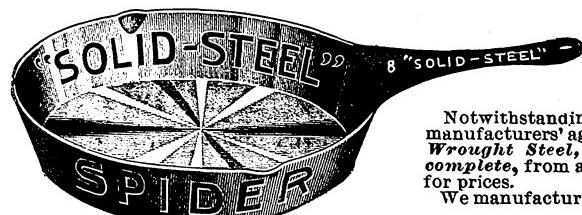
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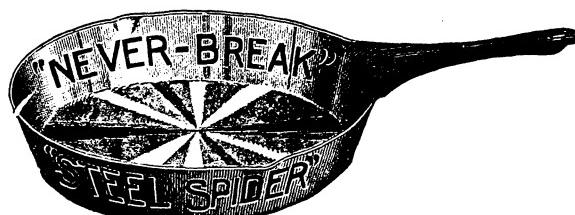
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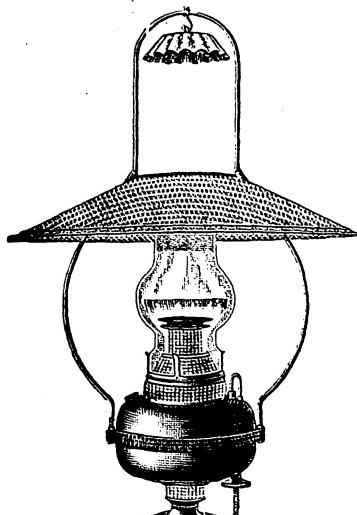
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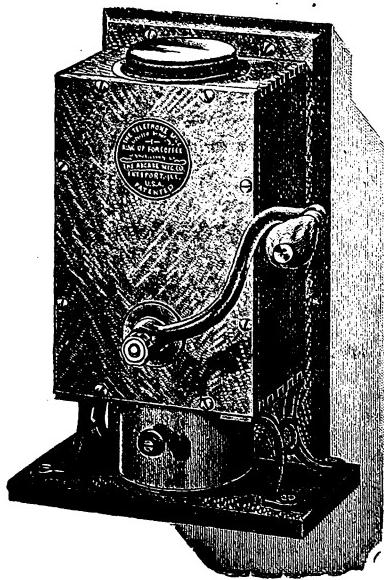
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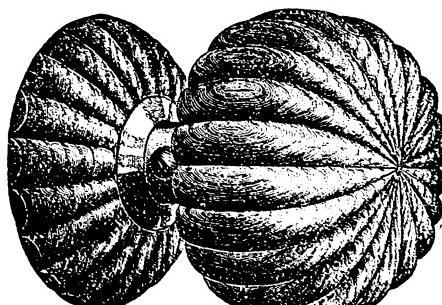
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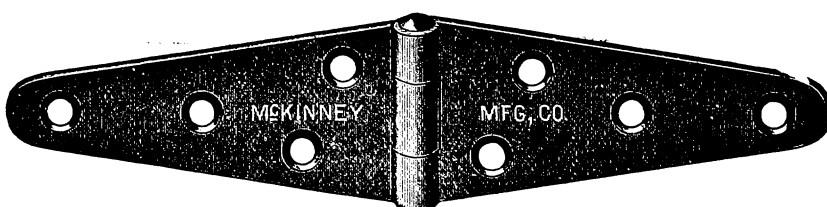
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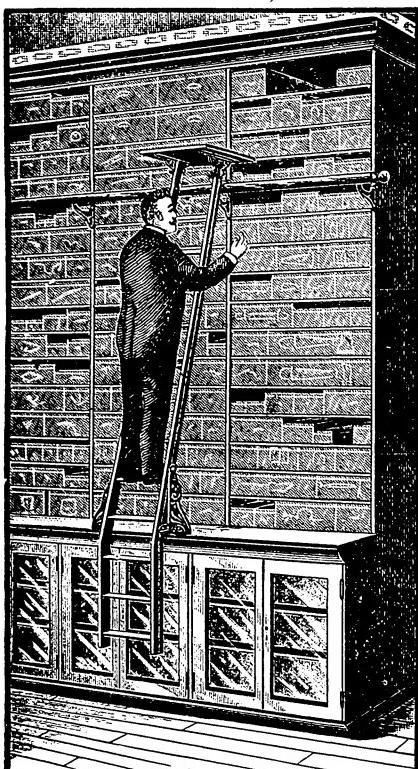
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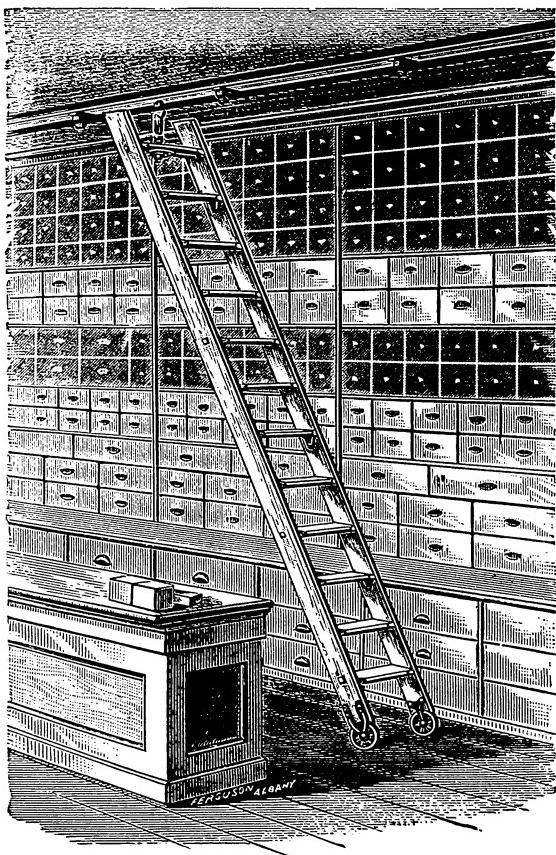
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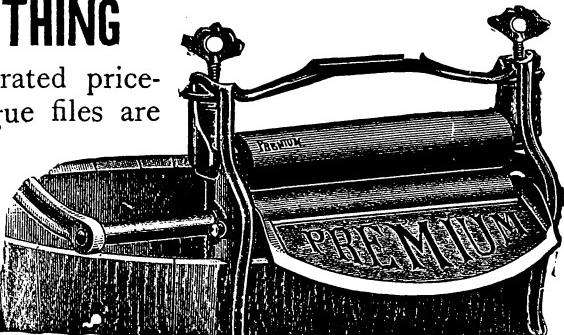
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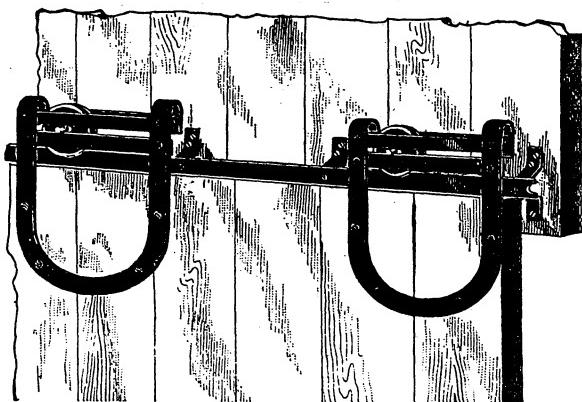
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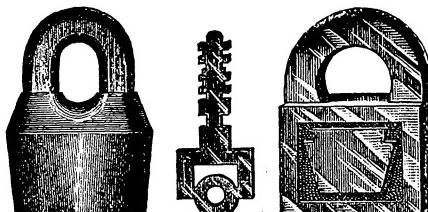
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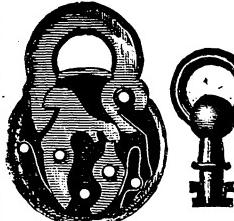
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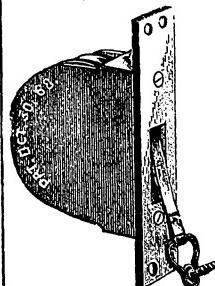
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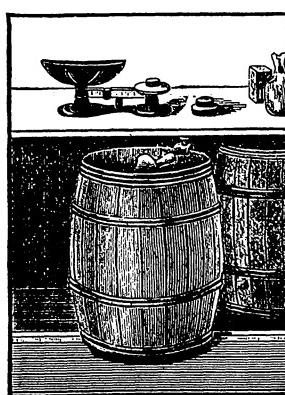
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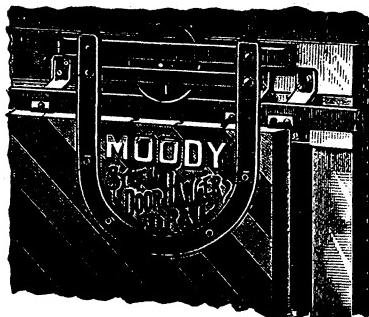
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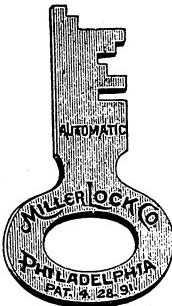
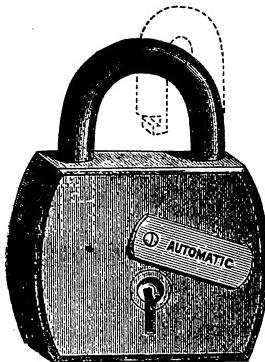
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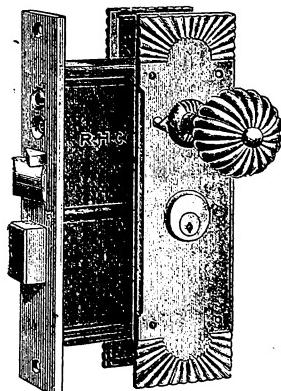
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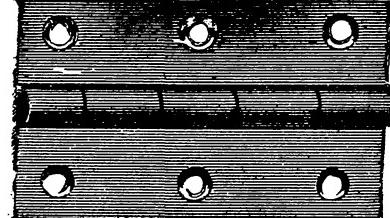
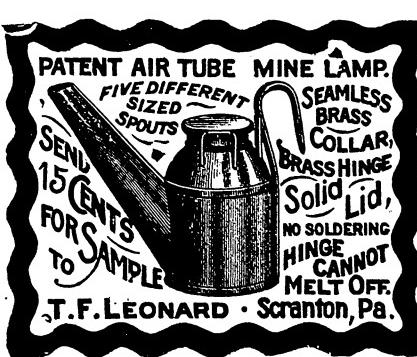
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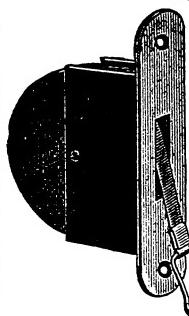
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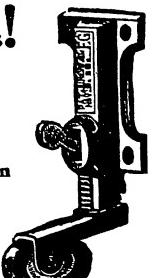
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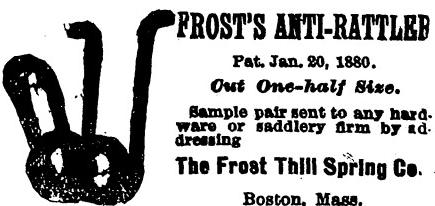
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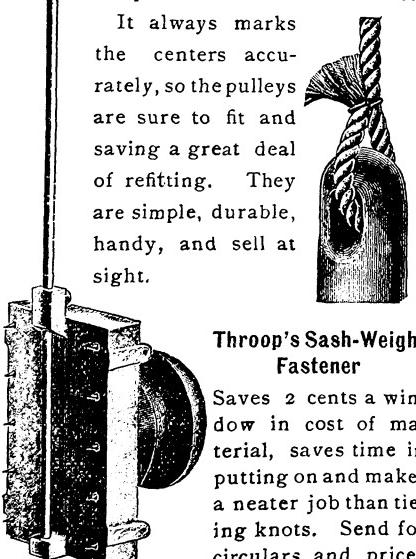
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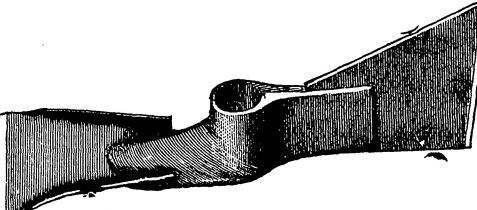
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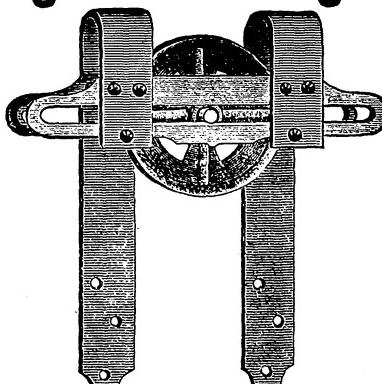


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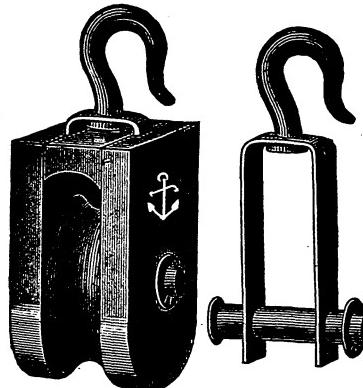
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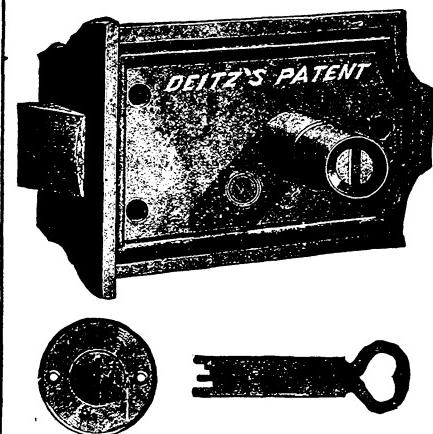
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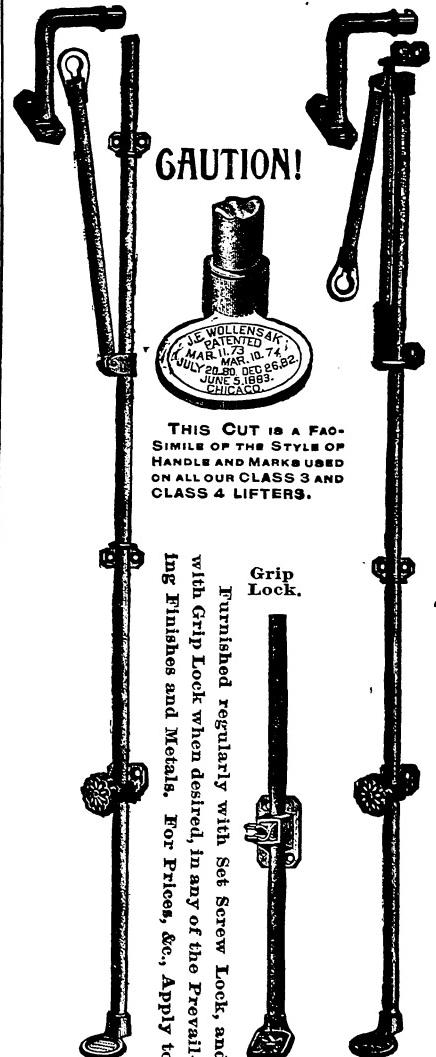
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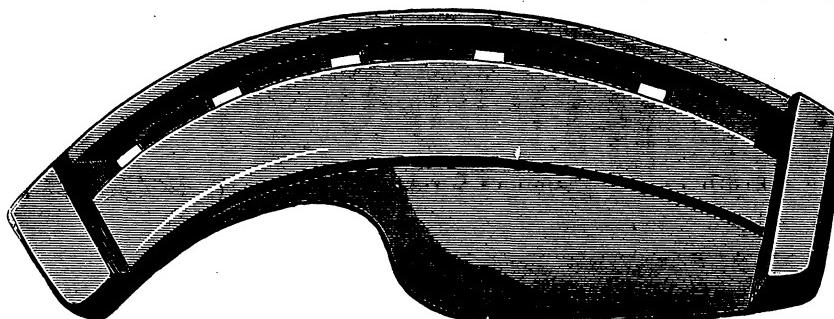
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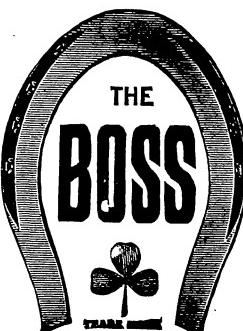
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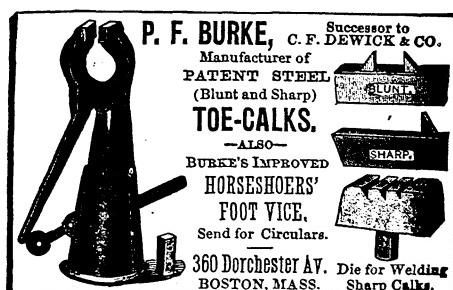
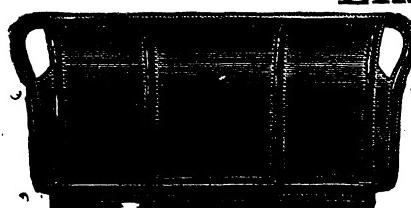
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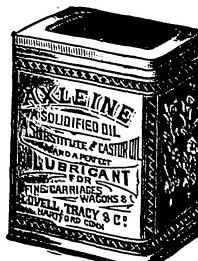
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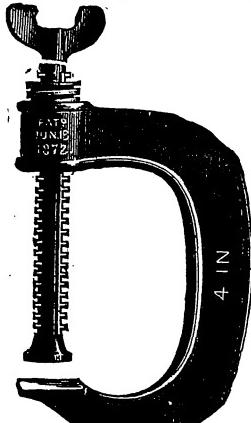
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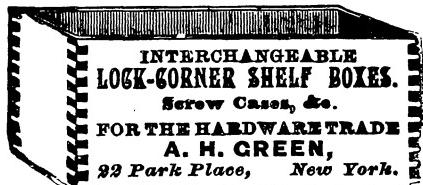
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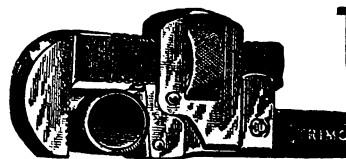
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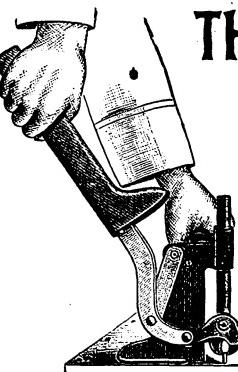
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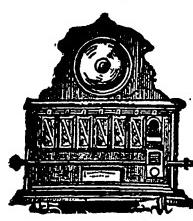
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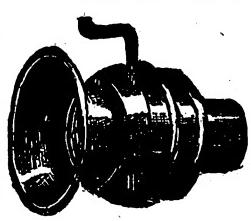
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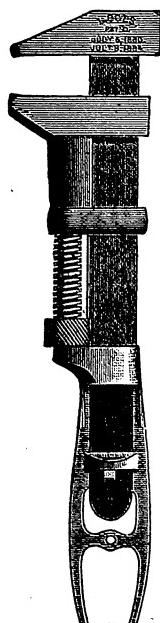
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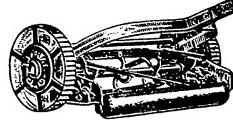
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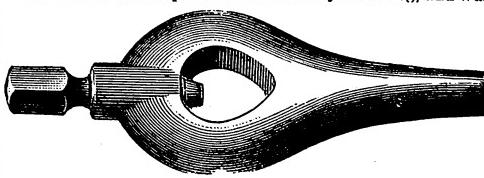
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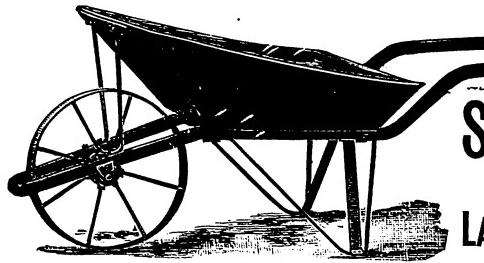
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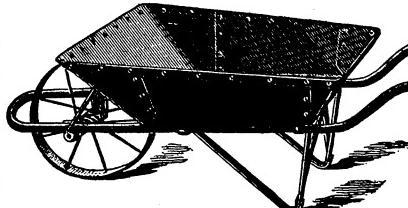


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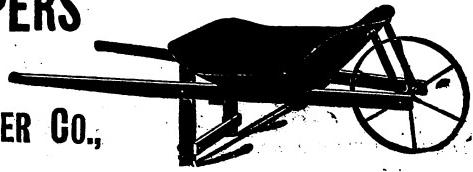
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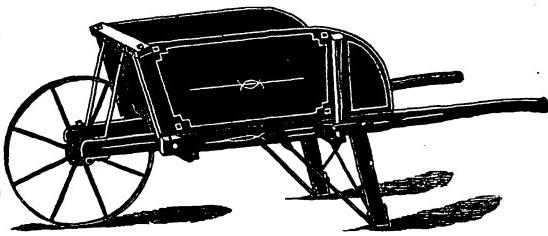
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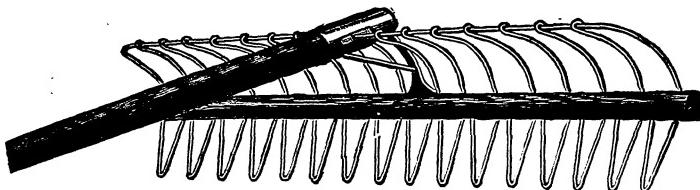
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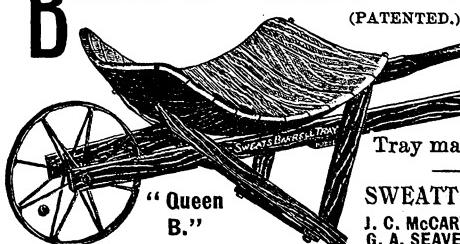
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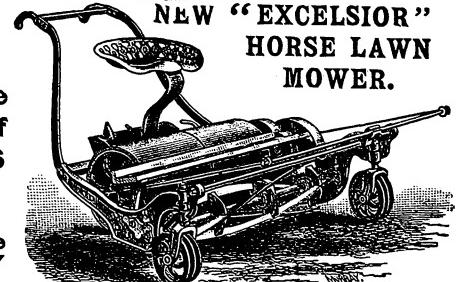
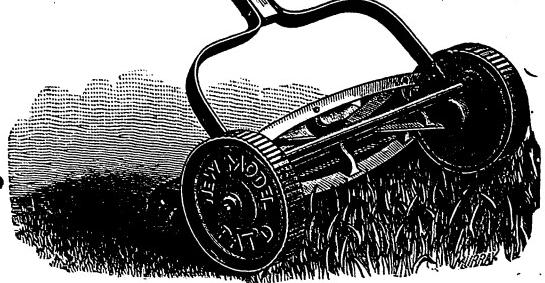
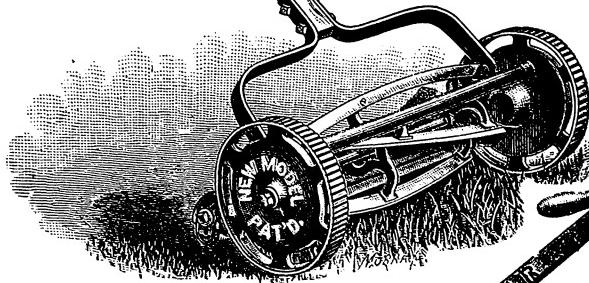
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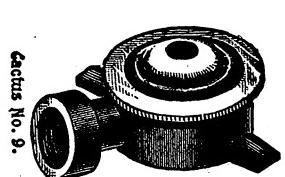
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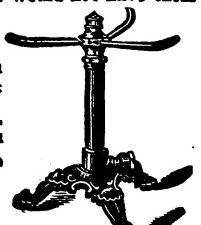


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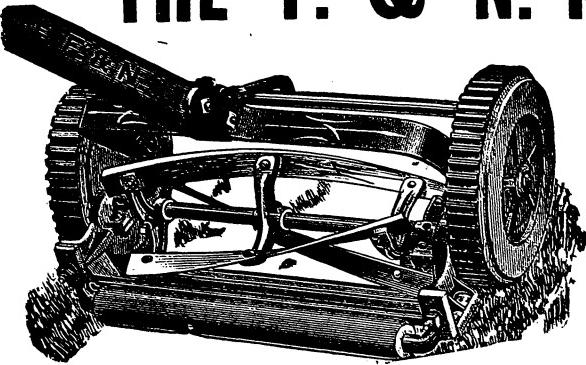
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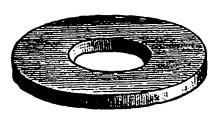
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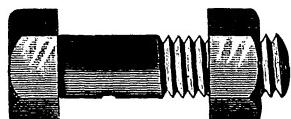
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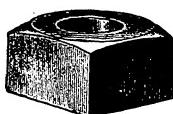
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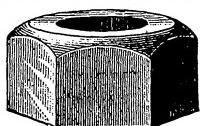
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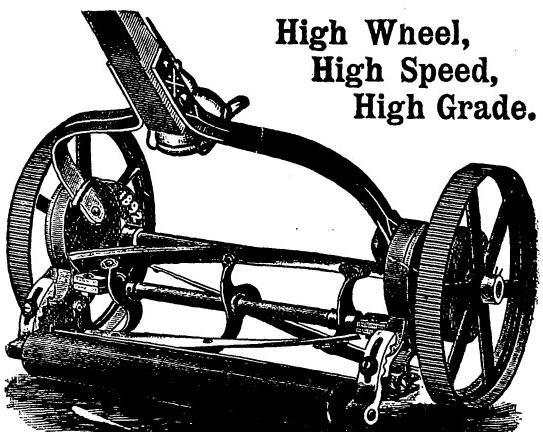


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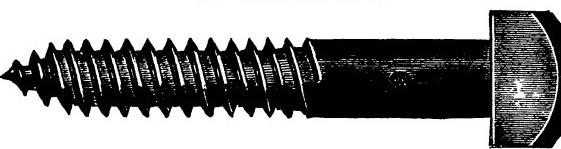
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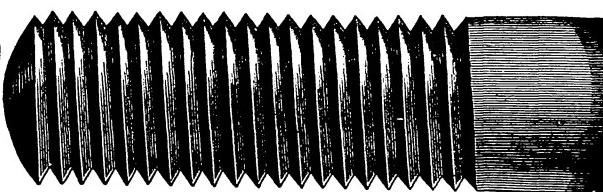


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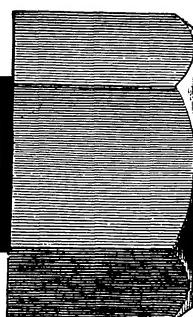
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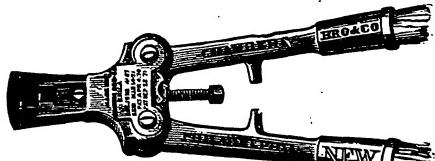


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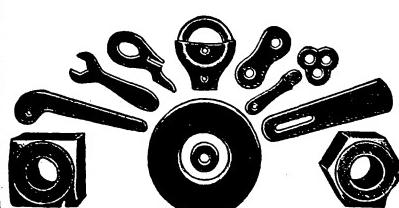
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- Air Chambers, Copper.** Emory, P. P. Mfg. Co., Springfield Mass.
Springfield Brass Co., Springfield, Mass.
- Air Compressors.** Norwalk Iron Works, S. Norwalk. Band Drill Co., 23 Park Place, N. Y.
- Air Moving Machinery.** Howard & Morse, 45 Fulton, N. Y.
- Aluminum.** Illinois Pure Aluminum Co., Lemont Ill. Pittsburgh Reduction Co., Pittsburgh. Scovill Mfg. Co., Waterbury, Conn.
- Aluminum, Brass and Bronze.** Gaylord, F. L. Co., Ansonia, Conn. Haigh & Clark, Albany, N. Y. St. Louis Bronze & Aluminum Works, St. Louis, Mo. Waldo & Stout, Bridgeport, Conn.
- Analytical Chemists.** Britton, J. Blodgett, Philadelphia, Pa. Hunt, Robt. W. & Co., Chicago, Ill. Moore, Dr. Gideon E., 221 Pearl St., N.Y.
- Anti-Friction Metals.** —See Babbitt Metal
- Anvil and Vise (Combination).** Fulton Iron & Engine Works, Detroit, Mich.
- Anvils.** Eagle Anvil Works, Trenton, N. J. Wright, Peter & Sons, Dudley, Eng.
- Arms and Ammunition.** Forehand Arms Co., Worcester, Mass. Hartley & Graham, 313 & 315 Broadway, New York. Stevens, J., Arms and Tool Co., Chico-pee Falls, Mass. Union Metallic Cartridge Co., 313 & 315 Broadway, N. Y.
- Auctioneers.** Haydock & Bissell, N. Y.
- Axes.** Peck, A. G. & Co., Cohoes, N. Y.
- Axle Grease.** Lovell, Tracy & Co., Hartford, Conn.
- Axles, Springs, &c.** Manufacturers of Bettendorf Hollowsteel Axle Works, Bettendorf, Ia. Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa. Wurster, F. W. & Co., Brooklyn, N. Y.
- Babbitt Metal.** Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn. Crown Smettina Co., Chester, Pa. Hertz, T. & Son, St. Louis, Mo. Keys, W. W. & R. M. Co., Bridgeport, Conn. Reeves, Paul S., Philadelphia, Pa. Shaw, Luther & Son, Worcester, Mass.
- Bakers and Roasters.** Bronson Supply Co., Cleveland, Ohio.
- Ball Ties.** Kilmer Mfg. Co., Newburg, N. Y.
- Band Saw Machines.** Cross & Spels Machine Co., Waterbury, Conn.
- Band Saws.** Atkins, E. C. & Co., Indianapolis, Ind.
- Barb Wire and Fence.** Consolidated Steel & Wire Co. St. Louis, Mo. Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa. Indiana Wire Fence Co., Crawfordsville, Ind. Kilmer Mfg. Co., Newburg, N. Y. Ludlow-Saylor Wire Co., St. Louis, Mo. Wasaburn & Moen Mfg. Co., Worcester.
- Bar Iron.** Manufacturers of Alsta-Standard Iron & Steel Co., Bridgeport. Allentown Rolling Mill, Philadelphia. Burden Iron Co., Troy, N. Y. Montour Iron & Steel Co., Danville, Pa. Monongahela Valley Iron Co., Youngstown, Ohio. Sterrett, J. H. & Son, Reading, Pa.
- Barrel Spring.** Leatt Machine Co., Orange, Mass.
- Bellows, Manufacturers of.** Bullock Bellows Co., Cleveland, O. Scott, Geo. M., Chicago, Ill.
- Bells.** Heyn Bros. Mfg. Co., East Hampton. Belt Dressing. Jos. Dixie Crucible Co., Jersey City, N.J.
- Belt Fasteners.** Bristols' Mfg. Co., Waterbury, Conn. Clafsen Mfg. Co., Cleveland, Ohio. Talcott, W. O., Providence, R. I.
- Beltting, Makers of.** Alexander Bros., 12 N. 3d, Phila. Jeffrey Mfg. Co., Columbus, O. Link-Belt Engineering Co., Phila., Pa. Main Belting Co., Philadelphia, Pa. N. Y. Belting & Packing Co., Ltd., N. Y. Roberts Mfg. Co., Pittsburgh, Pa. Shultz Belting Co., St. Louis, Mo.
- Bicycles.** Bingham, W. Co., Cleveland, Ohio. Common Sense Bicycle Mfg. Co., Phila. Coventry Machinist Co., Ltd, Boston, Mass.
- Hulbert Bros. & Co., 26 W. 23d St N. Y. Lovell, Jno. P. Arms Co., Boston, Mass. Marble Cycle Mfg. Co., Plymouth, Ind. Monarch Cycle Co., Chicago, Ill. Parry Mfg. Co., Indianapolis, Ind. Pope Mfg. Co., Boston, Mass. Read, Wm. & Sons, Boston, Mass. Remington Arms Co., 313 Broadway, N. Y.
- Rouse, Hazard & Co., Peoria, Ill. Toledo Bicycle Co., Toledo, O. Western Wheel Works, Chicago, Ill.
- Bill Register.** Clarke, T. M., Bloomington, Ill.
- Bit Gauge.** Stringfellow, J. B. & Co., Pawtucket, R. I.
- Blits and Braces.** Am. Bit Brace & Tool Co., Buffalo, N. Y. Bridgeport Gun Implement Co., 313 315 Broadway, N. Y.
- Graham Jno. H. & Co., 113 Chambers St., N. Y.
- Jennings, C. E. & Co., 97 Chambers, N.Y.
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- Shubert & Cottingham, Philadelphia, Pa. Toledo Block Works Toledo, O.
- Blowers.** Buffalo Forge Co., Buffalo, N. Y. Champion Blower & Forge Co., Lancaster, Pa. Sturtevant, B. F. & Co., Boston, Mass.
- Boiler Makers, Rolls.** New Doty Mfg. Co., Janesville, Wis.
- Boiler Plates.** Carbon Steel Co., Pittsburgh, Pa. McIlvain, Wm. & Sons, Reading, Pa. Lukens Iron & Steel Co., Coatesville, O. Pottstown Iron Co., Pottstown, Pa.
- Boilers, Copper.** Randolph & Clowes, Waterbury, Conn.
- Boilers, Steam.** Babcock & Wilcox Co., 80 Cortlandt, Edge Moor Iron Co., Wilmington. Harrison Safety Boiler Wks., Phila., Pa. Phoenix Iron Works Co., Medeville, Pa. Pollock, W. B. & Co., Younstown, O. Southwark Fdy & Mch. Co., Phila., Pa. Wetherill, Robt. & Co., Chester, Pa.
- Bolt Cutters.** Chambers Bros. Co., Philadelphia. Howard Iron Works, Buffalo, N. Y. Wells Bros. Co., Greenfield, Mass. Wiley & Russell Mfg. Co., Greenfield Mass.
- Books.** Laird & Lee, Chicago, Ill. Lamberson, B., Portland, Ore. Marine Review, Cleveland, Oh'io. Williams, David, 96-102 Reade, N. Y. Wolcott & West, Syracuse, N. Y.
- Box Bander.** Goodell, J. W., Burlington, Vt.
- Boxes, Hdw., Shelt., &c.** Green, A. H., 22 Park Place, N. Y. Jones, Jesse & Co., Philadelphia, Pa.
- Box Straps and Corners.** Buffalo Specialty Mfg. Co., Buffalo, N. Y.
- Brake Shoes.** Sargent Co., Chicago, Ill.
- Brass.** Manufacturers of Ansonia Brass & Copper Co., N. Y. Davol, John & Sons, 100 John, N. Y. Holmes, Booth & Haydens, N. Y. Plumb & Ayres Mfg. Co., N. Y. Randolph & Clowes, Waterbury, Conn. Rome Brass and Copper Wks., Rome, N. Y. Scovill Mfg. Co., Waterbury, Conn. Waterbury Brass Co., 290 Broadway, N. Y.
- Brass Butt Hinges.** Tiebout, W. J., 16 & 18 Chambers Street, N. Y.
- Brass Foundries.** Best Fox Co., Pittsburgh, Pa. Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
- Coffee and Spice Mills.** Arcade Mfg. Co., E. Freeport, Ill.
- Coke.** Barnes, C. K. & Co., Philadelphia, Pa. Wister, Francis, Philadelphia, Pa.
- Coffee and Spice Mills.** Arcade Mfg. Co., E. Freeport, Ill.
- Collections.** Hardware Board of Trade (Limited 4 and 6 Warren, N. Y.)
- Condensers.** Worthington, Henry R., 86 & 88 Liberty Street, N. Y.
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- Copper.** Ames Sword Co., Chicopee, Mass. Aspinwall Brass & Copper Co., 19 and 21 Cliff St., N. Y.
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- Butts and Dinges.** McKinney Mfg. Co., Alleghany, Pa. Sabin Machine Co., Montpelier, Vt. Stanley Works, New Britain, Conn. Tiebout, W. J., 16 Chambers, N. Y.
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- Carriage Stands.** Hillebrand & Wolf, Philadelphia, Pa.
- Car Wheels.** Whitney, A. & Sons, Phila.
- Carriage Hardware, Makers of.** Govett's Saddlery Works, Farmer, N.Y. Eccles, Richard, Auburn, N. Y. McKinstry Dash & Hdw. Co., Ltd., Buffalo, N. Y.
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- Cheney, S. & Son, Manlius, N. Y. Chester Steel Casting Co., Phila. Chrome Steel Works, Brooklyn, N. Y. Ette & Henger Mfg. Co., St. Louis, Mo. Eureka Cast Steel Co., Chester, Pa. Flagg, Stanley G. & Co., Phila.
- Haight & Clark, Albany, N. Y. Hammer & Co., Branford, Conn. Herrick, J. A., 284 Pearl St., N. Y. Johnson Foundry Co., Johnstown, Pa. Johnson, I. G. & Co., Spuyten Duyvil, Mahoning Fdy & Mch. Co., Danville, Pa. Northwest Malleable Iron Co., Milwaukee, Wis.
- Palmer's & De Mooy, Cleveland, O. Passaic Art Casting Co., Passaic, N. J. Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
- Sargent Co., Chicago, Ill. Sessions Foundry Co., Bristol, Conn. Shickle, Harrison & Howard Iron Co., St. Louis, Mo.
- Spencer's, I. S. Sons, Guilford, Conn. Standard Fdy. & Mfg. Co., Cleveland, O. Standard Steel Casting Co., Thurlow, Pa.
- Syracuse Steel Foundry, Syracuse, N. Y. Taylor Iron & Steel Co., High Bridge, N.J. Totter & Hogg Iron & Steel Fdy Co., Pittsburgh, Pa.
- Trenton Mal. Iron Co., Trenton, N. J. Union Mfg. Co., 108 Chambers St., N.Y. West Coxsackie Iron Fdy., Coxsackie, N. Y.
- Wetherill, Robt. & Co., Chester, Pa.
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- Cherry Stoners.** Goodell Co., Antrim, N. H.
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- Chisels, Manufacturers of.** Buck Bros., Millbury, Mass. White, L. & J. Co., Buffalo, N. Y.
- Chucks.** Cushman Chuck Co., Hartford, Conn. Hoggon & Pettis Mfg. Co., New Haven, Conn.
- Horton, E. & Sons Co., Windsor Locks Conn.
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- Clamps.** Hammer & Co., Branford, Conn. Le Count, W. W., So. Norwalk, Conn.
- Clipping Machines.** Hotchkiss, E. S., Bridgeport, Conn. McCoy, Jos. F., & Co., 2d Warren St.
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- Copper.** Ames Sword Co., Chicopee, Mass. Aspinwall Brass & Copper Co., 19 and 21 Cliff St., N. Y.
- Hendricks Bros., 49 Cliff, N. Y. New Haven Copper Co., 294 Pearl, N. Y. Randolph & Clowes, Waterbury, Conn. Rome Brass and Copper Works, Rome, N. Y.
- Wister, Francis, Philadelphia, Pa.
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- Cordage.** Elizabethport Cordage Co., 46 South Sampson Cordage Works, Boston, Mass. Travers Bros. Co., 107 Duane St., N. Y.
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- Counting Machines.** Osborn, G. Edw. & Co., New Haven, Ct.
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- Coverings, Hollar and Pipe.** Johns, H. W. Mfg. Co., 87 Maiden Lane, Cranes.
- Allentown Rolling Mills, Allentown, Pa. Detroit Foundry Equipment Co., Detroit, Mich.
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- Sellers, Wm. & Co., Inc., Phila., Pa. Yale & Towne Mfg. Co., Stamford, Conn.
- Capolax, Hot-Blast.** Byram & Co., Detroit, Mich. Collian, Victor, Detroit, Mich.
- Detroit Fdy. Equipment Co., Detroit, Mich.
- Curry Combs.** Kohler, F. E. & Co., Canton, O. Noyes, B. B. & Co., Greenfield, Mass.
- Cutlery Cases.** Torrey, J. R. & Co., Worcester, Mass.
- Cutlery, Importers of.** Gurney, Fred B., 116 Chambers St., N. Y.
- Sickles, Sweet & Lyon, 85 Barclay, N.Y.
- Cutlery, Manufacturers of.** Christy Knife Co., Fremont, O. Curley, J. & Bro., 6 Warren St., N. Y.
- Dame, Stoddard & Kendall, Boston Mass.
- Electric Cutlery Co., 118 Chambers, N.Y. Goodell Co., Antrim, N. H. Northampton Cutlery Co., Northampton, Mass.
- Wilson, John, Sheffield, England.
- Cutting-off Tools.** Am. Vending Mch. Co., 29 Murray, N.Y.
- Designer, Metal Work.** Arnold, F. H., New Britain, Conn.
- Dies.** Wilson, J. Fred, Worcester, Mass.
- Dipper Handles.** Home Novelty Mfg. Co., St. Louis, Mo.
- Dog Collars.** Chapman Mfg. Co., Meriden, Conn. Kelley & Woolworth, Niagara Falls, N. Y.
- Door Checks.** Utility Door Check Co., Chicago, Ill.
- Door Knobs.** Bardisley, J., 149 & 151 Baxter St., N. Y.
- Drilling Machines.** Bickford Drill & Tool Co., Cinn., Ohio. Buffalo Forge Co., Buffalo, N. Y. Burnham, Geo. Co., Worcester, Mass. Champion Blower and Forge Co., Lancaster, Pa.
- Colburn, A. L., New Haven, Conn. Dallett, Thos. H. & Co., Philadelphia. Dwight slate Machine Co., Hartford Conn.
- Halsey, Jas. T., Philadelphia, Pa. Illinois Iron and Bolt Co., Carpenterville, Ill.
- Norton & Jones Machine Tool Works, Plainville, Conn.
- Quint, A. D., Hartford, Conn. Sellers, Wm. & Co., Inc., Phila., Pa. Sibley & Ware, So. Bend Ind. Sigourney Tool Co., Hartford, Conn. Silver Mfg. Co., Salem, O. Smith Friction Drill & Tool Co., Boston, Mass.
- Drop Forgings.** Belding Mch. Co., New Haven, Conn. Billings & Spencer Co., Hartford, Conn.
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- Merrill Bros., 2d First, Brooklyn, E. D. Miner & Peck Mfg. Co., New Haven, Conn. Scranton Forging Co., Scranton, Pa. Spiers, J. C. & Co., Worcester, Mass. Williams, J. H. & Co., Brooklyn, N. Y. Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Drop Presses.** Bliss, E. W. & Co., Brooklyn, N.Y. Crosby, G. A. & Co., Chicago, Ill. Eaton, Geo. H. & Co., Boston, Mass. Miner & Peck Mfg. Co., New Haven, Conn.
- Stiles & Parker Press Co., Brooklyn, N. Y.
- Dumb Walters.** Storm Mfg. Co., Newark, N. J.
- Dust Beaters.** Peabody & Parks, Troy, N. Y.
- Dynamite.** New York Powder Co., 62 Liberty St., N. Y.
- Dynamos.** C. & C. Electric Motor Co., 402 and 404 Greenwich St., N. Y.
- Lovell Mfg. Co., Ltd., Erie, Pa. Zucker & Levett Chemical Co., 14 Grand St., N. Y.
- Edge Tools, Makers of.** Suck Bros., Millbury, Mass.
- Butcher, W. S., 136 Duane St., N. Y. Buffalo Edge Tool Wks., Buffalo, N. Y. Plumb, Fayette R., Philadelphia, Pa. White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters.** North Bros. Mfg. Co., Philadelphia.
- Electric Belts and Supplies.** Ostrander, W. R. & Co., 204 Fulton St., New York.
- Electric Dynamo Machines.** J. F. W., Chicago, Ill.
- Electric Elevators.** Boardman, L. & Son, East Haddam, O.
- Elevators, Makers of.** Link-Belt Engineering Co., Phila., Pa. Moline Elevator Co., Moline, Ill. Morse, Williams & Co., Phila., Pa. Salem Fdy. & Mch. Co., Salem, Mass.
- Emery and Emery Wheels.** Bell, Geo. E., 38 John St., N. Y. Grant, Cumulum, Wheel Mfg. Co., Worcester, Mass.
- Hampton Emery and Corundum Co., Chester, Mass.
- Michigan Emery Wheel Co., Detroit, Mich.
- N.Y. Belting & Packing Co., Ltd., N.Y. Northampton Emery Wheel Co., Leeds, Mass.
- Nonon Emery Wheel Co., Worcester, Mass.
- Springfield Emery Wheel Mfg. Co., Bridgeport, Conn. Waltham Emery Wheel Co., Waltham, Mass.
- Enamels.** Nubian Iron Enamel Co., Cragin, Ill.
- Engineers and Contractors.** Alken Henry, Pittsburgh, Pa. Artificial Gas Engineering Co., Pittsburgh, Pa.
- Carten, Henry J., Pittsburgh, Pa. Christie, W. Wallace, Paterson, N. J. Herrick, J. A., 284 Pearl St., N. Y. Kennedy, Julian, Pittsburgh, Pa. Laughlin, Alex. & Co., Pittsburgh, Pa. Lean, D. R. Co., Pittsburgh, Pa. McClure, Ansler & Co., Pittsburgh, Pa.

- Pittsburgh Iron & Steel Engineers.** Co., Pittsburgh, Pa.
Roberts, Frank C. Philadelphia, Pa.
Smythe, S. R. Co. incorporated Pittsburgh, Pa.
Swindell, W. & Bros. Pittsburgh, Pa.
Wilkie, Bothwell & Co., Ltd. Pittsburgh, Pa.
Witherow, Jas. P. Co. Pittsburgh, Pa.
Engines, Gas. Otto Gas Engine Works, Phila., Pa.
 Rollason Gas Engine, Havemeyer Bldg., N. Y.
Engines, Steam. Makers of. Bass Foundry & Machine Works, Ft. Wayne, Ind.
 Buckeye Engine Co., Salem, O.
 Cleveland & Hardwick, Erie, Pa.
 Harrisburg Fdy. & Machine Works, Harrisburg, Pa.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Phoenix Iron Wks. Co., Meadowville, Pa.
 Shipman Engine Co., Boston, Mass.
 Southwark Foundry and Machine Co., Phila., Pa.
 Tod, William & Co., Youngstown, O.
 Wetherill, Robt. & Co., Chester, Pa.
Exhaust Tumblers. Sweeter, W. A., Brookton, Mass.
Expander Belts. Boone, W. C. & Son, Brooklyn, N. Y.
 Church, Isaac, Toledo, O.
Faucets, Self-Measuring. Lane Bros., Poughkeepsie, N. Y.
Faucets. Wooden. Makers of. Boston & Lockport Block Co., Boston Mass., and Lockport, N. Y.
 John Sommer's Son, Newark, N. J.
Feed-Water Heaters. Davis, I. B. & Son, Hartford, Conn.
 Goubert Mfg. Co., 32 Cortlandt St., N. Y.
 Harrson Safety Boiler Wks., Phila., Pa.
 National Pipe Bending Co., New Haven, Conn.
 Webster, Warren & Co., Phila., Pa.
 Whitlock Coll Pipe Co., Elmwood, Conn.
Fencing, Iron and Wire. Barnum, E. T., Detroit, Mich.
 Champion Iron Co., Kenton, O.
 Clinton Wire Cloth Co., Clinton, Mass.
 DeKalb Fence Co., DeKalb, Ill.
 Gilbert & Bennett Mfg. Co., 42 Cliff St.
 Hartman Mfg. Co., Beaver Falls, Pa.
 Kilmer Mfg. Co., Newburgh, N. Y.
 Mast, Foos & Co., Springfield, O.
 The Van Dorn Iron Works Co., Cleveland, O.
 Reliance Wire Works Co., Milwaukee.
Files, Importers of. Moss, F. W., 80 John, N. Y.
Files and Hammers, Manufacturers of. Bunker & White, Troy, N. Y.
 Barnett, G. H., 41 & 48 Richmond Phila.
 Butcher, W. & S., 186 Duane St., N. Y.
 McCaffrey File Co., Philadelphia.
 Nicholson File Co., Providence, R. I.
Fire Brick, Makers of. Borgner, Cyrus, Philadelphia, Pa.
 Gardner, Jas. & Son, Cumberland, Md.
 Kreischer B. & Sons, foot E. Houston, St.
 McLeod & Henry Co., Troy, N. Y.
 Maurer, H. & Son, 420 E. 23d, N. Y.
 Ostrander Fire Brick Co., Troy, N. Y.
 Presbrey Stove Lining Co., Taunton, Mass.
 Valentine, M. L. & Bro., Woodbridge.
Fire Sets. Troy Nickel Works, Troy, N. Y.
Fishing Tackle. Dame, Stoddard & Kendall, Boston, Mass.
Flint and Emery Paper. Baeder, Adamson & Co., Phila., Pa.
Flue Cleaners. Mackey, Jas. T. St. Louis, Mo.
Fly Fans. Mathai, Ingram & Co., Baltimore, Md.
Fodder Cutters. Silver Mfg. Co., Salem, O.
Forges, Portable, &c. Bradley & Co., Syracuse, N. Y.
 Bullock Bellows Co., Cleveland, O.
 Buffalo Forge Co., Buffalo, N. Y.
 Champion Blower & Forge Co., Lancaster, Pa.
 Empire Portable Forge Co., Lansingburg, N. Y.
 Foos Mfg. Co., Springfield, Ohio.
 Sturtevant, B. & Co., Boston, Mass.
Forgings, Iron and Steel. Bethlehem Iron Co., S. Bethlehem, Pa.
 Cambria Steel, Cambria Iron Co., Johnstown, Pa.
 Scranton Forging Co., Scranton, Pa.
Foundry Facings. Chicago Fdy. Supply Co., Chicago, Ill.
 MacKellar Foundry Facing & Supply Co., Quincy, Ill.
 Parson, J. W. & Co., Phila.
 S. Obermayer Co., Cincinnati, O.
 Smith, J. D. Fdy. Supply Co., Cinn., O.
 Whitehead Bros. Co., 517 W. 15th St.,
Foundry Riddles. Estey, W. S., 65 Fulton, N. Y.
Foundry Supplies. Chicago Fdy. Supply Co., Chicago, Ill.
 Collie, Victor, Detroit, Mich.
 MacKellar Fdy. Facing & Supply Co., Quincy, Ill.
 S. Obermayer Co., Cincinnati, O.
 Paxson, J. W. & Co., Philadelphia.
 Smith, J. D. Fdy. Supply Co., Cinn., O.
 Whitehead Bros. Co., 517 W. 15th St.,
Friction Clutches. Keystone Clutch & Mch. Wks., Phila., Pa.
 Moore & White Co., Philadelphia, Pa.
Fruit Presses. Enterprise Mfg. Co., Philadelphia, Pa.
Fuel Burners. Collins, W. S., 45 Drexel Bldg., N. Y.
Furnaces, Foundry. Byram & Co., Detroit, Mich.
Garden Tools. Noyes, B. B. & Co., Greenfield, Mass.
Gas Producers. Wood, R. D. & Co., Philadelphia, Pa.
Gas & Steam Puffers' Supplies. Pancoast & Manle, Phila., Pa.
Gauge, Rolling Mill. Haines Gauge Co., Philadelphia, Pa.
Gear Cutters. T. E. Whiton Mach. Co., New London, Conn.
Gears. Boston Gear Works, Boston Mass.
 New Process Raw Hide Co., Syracuse, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Union Fdy. & Mch. Co., Pittsburgh, Pa.
Glass Boards. Canton Saw Co., Canton, O.
Glass Tubes. Ashcroft Mfg. Co., 111 Liberty St., N. Y.
Glass Cutters. Monce, S. G., Bristol, Conn.
Glue. Baeder, Adamson & Co., Phila., Pa.
 Russia Cement Co., Gloucester, Mass.
Grass Catchers. Supplee Hardware Co., Phila., Pa.
Grinding Mills. Foos Mfg. Co., Springfield, O.
Grinding and Polishing Machines. Norton Emery Wheel Co., Worcester, Mass.
 Washburn Shops, Worcester, Mass.
Grindstone Dressing Machinery. Blake & Johnson, Waterbury, Conn.
Grindstones. Cleveland Stone Co., Cleveland, O.
 Huron Grindstone Co., Fort Austin, Mich.
Gunpowder, Makers of. Lafin & Rand Powder Co., N. Y.
Hand Carts. Lansing Wheelbarrow Co., Lansing, Mich.
Halter Chains. Kelley & Woolworth, Niagara Falls, N. Y.
Handles. New Process Raw Hide Co., Syracuse N. Y.
 New York Mallet and Handle Wks., 456 E. Houston St., N. Y.
Hangers, Door. Chicago Spring Butt Co., Chicago, Ill.
 Lane Bros., Poughkeepsie, N. Y.
 Victor Mfg. Co., Newburyport, Mass.
Hardware Comm'r Merchants. Doscher, Martin, 88 Chambers, N. Y.
 Graham, John H. & Co., 111 Chambers St., New York.
 Jacobus, W. H., 90 Chambers, N. Y.
Hardware Manufacturers. Hotchkiss, E. S., Bridgeport, Conn.
 Russell & Erwin Mfg. Co., Chambers St., New York.
 Stearns, E. C. & Co., Syracuse, N. Y.
 Union Mfg. Co., 108 Chambers, N. Y.
 Yale & Towne Mfg. Co., Stamford, Conn.
Hardware Mfrs. Agents. Bingham, W. Co., Cleveland, O.
 Graham, John H. & Co., 113 Chambers, Husey, E. J. & Co., 80 John St., N. Y.
 McCoy, Jose F. Co., 28 Warren St., N. Y.
 Sickles, Sweet & Lyon, 35 Barclay, N. Y.
 Underhill, Clinch & Co., 94 Chambers St., N. Y.
Hardware Specialties. Acme Shear Co., Bridgeport, Conn.
 Belden Machine Co., New Haven, Conn.
 Empire Portable Forge Co., Lansingburg, N. Y.
 Enterprise Mfg. Co., Philadelphia, Pa.
 Ette & Henger Mfg. Co., St. Louis, Mo.
 Hart, H. C. Mfg. Co., Detroit, Mich.
 Henn, A. S. & Co., New Haven, Conn.
 Home Novelty Mfg. Co., St. Louis.
 Knapp & Cowles Mfg. Co., Bridgeport, Conn.
 North Bros. Mfg. Co., Philadelphia, Pa.
 Peabody & Parks, Troy, N. Y.
 Welland, Chas., 143 Chambers St., N. Y.
 Wilson, J. Fred, Worcester, Mass.
 Wire Goods Co., Worcester, Mass.
 Underhill, Clinch & Co., 94 Chambers Street, N. Y.
Hardware, Yacht and Ship. Ferdinand, L. W. & Co., Boston, Mass.
Harness Snaps. Covert Mfg. Co., West Troy, N. Y.
 Coverts' Saddlery Wks., Farmer, N. Y.
 Fitch, W. & E. T., New Haven, Conn.
Hay Knives. Holt, Hiram, Co., E. Wilton, Me.
Hoisting Machines. Cox, Alfred & Co., 314 Green, Phila.
 Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
 Fulton Iron & Engine Wks., Detroit, Mich.
 Harrington, E., Son & Co., Phila.
 Lane Bros., Poughkeepsie, N. Y.
 Lidgerwood Mfg. Co., 98 Liberty, N. Y.
 Maris & Beckley, Philadelphia.
 Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Hollow-Ware. Bronson Supply Co., Cleveland, Ohio.
 Morse, William & Co., Phila.
 Sellers, Wm. & Co., Phila. and N. Y.
 Speidel, J. G., Reading, Pa.
 Yale & Towne Mfg. Co., Stamford, Ct.
 Cleveland Stamping & Tool Co., Cleveland, O.
 Stuart & Peterson Co., Phila., Pa.
Holloware, Aluminum. Illinois Pure Aluminum Co., Lemont, Ill.
Horse and Barbers' Clippers. Hotchkiss, E. S., Bridgeport, Conn.
Horse Nails, Makers of. National Horse Nail Co., Vergennes, Vt.
Horse Shoes, Makers of. Burden Horse Shoe Co., Catskill, Pa.
 Burden Iron Co., Troy, N. Y.
 Diamond State Iron Co., Wilmington, Del.
 Old Dominion Iron & Nail Works Co., Richmond, Va.
 Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
 Rhode Island Perkins Horse Shoe Co., Providence.
 Standard Horse Shoe Co., Boston, Mass.
 The Burden Iron Co., Troy, N. Y.
Hose. Cleveland Rubber Co., Cleveland, O.
 N. Y. Betting & Packing Co., Ltd., 15 Park Row, N. Y.
Hose Menders. Hudson, C. E. & Co., Leominster, Mass.
Hotels. The Audubon, Chicago, Ill.
Hydrants, &c. McLean, John, 296 & 298 Monroe, N. Y.
Hydraulic Jacks. Dudgeon, Richard, 24 Columbia, N. Y.
 Watson & Stillman, 204 E. 43d, N. Y.
Ice-Cream Freezers. North Bros. Mfg. Co., Phila., Pa.
 Packer, C. W., Philadelphia, Pa.
 White Mountain Freezer Co., Nashua, N. H.
Ice Shavers. Enterprise Mfg. Co., Philadelphia, Pa.
Injectors. Jenkins Bros., New York
Insurance, Boiler. Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
Iron and Steel, Swedish. Lundberg, Gustaf, Boston, Mass.
 Milne, A. C., 1 Broadway, N. Y.
Iron Commission Brokers. Corning, Edw. & Co., 29 Bay, N. Y.
 Cotton, Bradley & Co., Philadelphia.
 Etting, Edw., Philadelphia.
 Hogan, John L. & Co., Philadelphia.
 Hoffman, J. W. & Co., Philadelphia.
 Lewis, Henry & Co., Philadelphia.
 Keeley, Jerome & Co., Philadelphia.
 Lee, J. Tatnall & Co., Philadelphia.
 Mohr, J. J., 430 Walnut, Philadelphia.
 Mann, E. H. & Co., Philadelphia.
 Pilling & Crane, Philadelphia, Pa.
 Sibell, Geo. H. & Co., Chicago, Ill.
 Wister, L. & R. & Co., Phila., Pa.
Iron Ore. Taylor & Co., 45 Wall, N. Y.
 Pickands, Brown & Co., Chicago, Ill.
 Pullman, J. Wesley, Phila., Pa.
 Samuel, Frank, Philadelphia, Pa.
Iron, Merchants. Barnes, C. K. & Co., Philadelphia, Pa.
 Borden & Lovell, 70 West, N. Y.
 Bussenius & Cunliffe, Philadelphia.
 Corning, Edw. & Co., 29 Bay, N. Y.
 Cox, Justice, Jr., Philadelphia.
 Cotton, Bradley & Co., Philadelphia.
 Hoffman, J. W. & Co., Philadelphia.
 Leonard, J., 446 West St., N. Y.
 Naylor & Co., 45 Wall St., N. Y.
 Nicolls, Wheeler & Co., Philadelphia.
 Ogden & Wallace, 85 Elm St., N. Y.
 Pickards, Brown & Co., Chicago, Ill.
 Pierson & Co., 24-27 West, N. Y.
 Richards, D. W. & Co., 88 Mangin St., N. Y.
 Wallace, Wm. H. & Co., Albany & Washington Streets, N. Y.
 Whitney, A. R. & Co., 17 Bay, N. Y.
 Wilson, H. & Co., Philadelphia.
Iron, importers. Abbott, Jere & Co., N. Y. and Boston.
 Lundberg, Gustaf, Boston, Mass.
Iron, Sheet, Manufacturers of. Cambridge Iron & Steel Co., Cambridge, Ohio.
 W. Dewees Wood Co., Lim., McKeesport, Pa.
Ironwork, Ornamental. Barnum, E. T., Detroit, Mich.
 Champion Iron Co., Kenton, O.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Mast, Foos & Co., Springfield, O.
 The Van Dorn Iron Works Co., Cleveland, O.
Keys. Wollensak, J. F., Chicago, Ill.
Ladders. Davies, Chas. & Co., Williamsport, Pa.
Ladies. Detroit Fdy. Equipment Co., Detroit, Mich.
Lamp Stoves. Glazier Stove Co., Chelsea, Mich.
Lamps. Standard Lighting Co., Cleveland, O.
Lanterns. Dietz, R. E. & Co., 60 Laight St., N. Y.
 Steam Gauge & Lantern Co., Syracuse, N. Y.
Lathes. Bradford Mill Co., Cincinnati, Ohio.
 Draper Machine Tool Co., Worcester, Mass.
 Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
 Sebastian, May & Co., Sidney, O.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Lathing, Wire. Railway Speed Recorder Co., Kent, O.
Lawn Mowers. Binham, W. Co., Cleveland, O.
 Blair Mfg. Co., Springfield, Mass.
 Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
 Coldwell Lawn Mower Co., Newburg, N. Y.
 F. & N. Mfg. Co., Richmond, Ind.
 Henley, M. C., Richmond, Ind.
 Lane, W. E., Syracuse, N. Y.
 Mast, Foos & Co., Springfield, O.
 Stearns, E. C. & Co., Syracuse, N. Y.
 Supplee Hdwy. Co., Phila., Pa.
Lawn Rakes. Gibbs Mfg. Co., Canton, O.
 Schaeffer & Co., Dayton, Ohio.
 Syracuse Specialty Mfg. Co., Syracuse N. Y.
Lawn Sprinklers. Blair Mfg. Co., Springfield, Mass.
 Ette & Henger Mfg. Co., St. Louis.
 McGowan, John H. Co., Cincinnati, O.
Lawn Sweepers. Lape, W. E., Syracuse, N. Y.
Lawn Swings. Davies, Chas. & Co., Williamsport, Pa.
Lemon Squeezers. Ripley Mfg. Co., U. ionville, Conn.
Letters, Paper. Tablet & Ticket Co., Chicago, Ill.
Levels. Davis & Cook, Watertown, N. Y.
 Richardson, C. F., & Son, Athol, Mass.
Locks & Knobs, Manufacturers of. Deltz, A. E., 97 Chambers, N. Y.
 Keyless Lock Co., Chicago, Ill.
 Reading Hdwy. Co., Reading, Pa.
 Russell & Erwin Mfg. Co., Chambers St., New York.
 Sargent & Co., 37 Chambers St., N. Y.
 Smith Eggge Mfg. Co., Bridgeport.
 Yale & Towne Mfg. Co., Stamford.
Lubricators. Wadham's Oil & Grease Co., Milwaukee Wis.
Machinery. Am. Tool Works, Cleveland, Ohio.
 Barnes, W. F. & John, Rockford, Ill.
 Becker, Jno. L. Mfg. Co., Fitchburg, Mass.
 Bechtel, Miles & Co., Philadelphia, Pa.
 Bigelow, C. E., 45 Bay, Cincinnati, O.
 Bignal & Keeeler Mfg. Co., St. Louis.
 Birmingham Iron Foundry, Birmingham, Conn.
 Blits, C. W. Co., Brooklyn, N. Y.
 Bogert, Jno. L., Flushing, N. Y.
 Bradford Mill Co., Cincinnati, O.
 Briggs, Marvin, 12 Broadway, N. Y.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Carlins Sons, Thos., Allegheny, Pa.
 Cinn. Milling Mch. Co., Cincinnati, O.
 Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
 Coulter & McKenzie Mch. Co., Bridgeport, Conn.
 Cruikshank, D. B., Providence, R. I.
 Detrich & Harvey Mch. Co., Baltimore, Md.
 Ehrhardt, Gustave & Sons, Pittsburgh, Pa.
 Fitchburg Mch. Works, Fitchburg, Mass.
 Garvin Mch. Co., Laight & Canal Sts., Newark, N. J.
 Gould & Eberhardt, Newark, N. J.
 Harrington, E. Son & Co., Phila., Pa.
 Hendey Machine Co., Torrington, Ct.
 Hill, Clarke & Co., Boston, Mass.
 Ingersoll Milling Machine Co., Rockford, Ill.
 Johnson, Israel H., Jr., & Co., Phila., Pa.
 Jones & Lamson Mch. Co., Springfield, Vt.
 Kelly, Daniel, Phila., Pa.
 Lodge & Davis Mch. Tool Co., Cincinnati, O.
 Lodge & Shipley Mch. Tool Works, Cincinnati, O.
 Lovegrove & Co., Philadelphia, Pa.
 McCabe, J. J., 68 Cortlandt, N. Y.
 Machinists Supply Co., Rochester, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Conn.
 Newark Mch. Tool Works, Newark, N. J.
 New Haven Mfg. Co., New Haven, Conn.
 New York Mach'y Depot, N. Y.
 Niles Tool Wks., 188 Liberty St., N. Y.
 Pedrick & Ayer, Philadelphia, Pa.
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
 Place, Geo., 120 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Pratt & Whitney Co., Hartford, Conn.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mohr, Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons L. F., Philadelphia, Pa.
 Septoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ld., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.
 Woodruff Mch. Co., Hartford, Conn.
Machinery for Hardware Manufacture. Adt, Jno. & Son, New Haven, Conn.
Machine Knives. Loring Coe & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.
Machine Tools.—See machinery.
Mechanic Work. Angus, C. H., Albany, N. Y.
Machinists' Scales. Comin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
Machinists' Tools and Supplies. Brown & Sharpe Mfg. Co., Providence, King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
Mallets. N. Y. Mallet & Handle Works, N. Y.
Manufacturing Sites. Kokomo Enterprise Co., Kokomo, Ind.
Mensural Tapes. Cuffman Rule Co., Saginaw, Mich.
Metal Cutters. Enterprise Mfg. Co., Philadelphia, Pa.
Mechanical Drawing. Correspondence School of Mechanics, Scranton, Pa.
Metals. Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
 Taylor & Co., 45 Wall, N. Y.
Metal Brokers. American Metal Co., N. Y.
Metallurgists. Britton, J. Blodgett, Phila.
Metal Saws. Ehrhardt, Gustave & Sons, Pittsburgh Q. & C. Co., Chicago, Ill.
Milling Machines. Brown & Sharpe, Providence, R. I.
 Cinc. Milling Mch. Co., Cincinnati, Ohio.
 Ingersoll Milling Machine Co., Rockford, Ill.
 Pedrick & Ayer, Phila., Pa.
Mincing Knives. Palmer Hdwy. Mfg. Co., Troy, N. Y.
Mine Lamps. Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
 Leonard, T. F., Scranton, Pa.
Mining Screens. Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.

- Model Work.**
Hurley Bros. Hartford, Conn.
- Molding Sand.**
Chicago Foundry Supply Co., Chicago, Ill.
- Obermayer, S. Co., Cincinnati, O.
- Faxon, J. W. & Co., Phila.
- Whitehead Bros. Co., 517 W. 15th St. N. Y.
- Motors, Water and Electric.**
C. & C. Electric Motor Co., 402 and 404 Greenwich St., N. Y.
- Thomason, Houston Motor Co., Boston, Mass.
- Mail Machinery.**
Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nails (Cut) and Spikes.**
Borden & Lovell, 70 West, N. Y.
- Cumbria Land Nail & Iron Co., Phila.
- Oxford Iron Co., 31 Washington, N. Y.
- Pottstown Iron Co., Pottstown, Pa.
- Riverside Iron Works, Wheeling, W. Va.
- Stebbins, C. J., 103 Reade, N. Y.
- Nickel Platers' Supplies.**
Eddy Electric Mfg. Co., Windsor, Conn.
- Zucker & Levett Chemical Company, 10 to 14 Grand St., N. Y.
- Norway Shapes, Rollers of.**
Rowland, William & Harvey, Franklin, Philadelphia.
- Nut Machines.**
Dunham Nut Mch. Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
American Bolt Co., Lowell, Mass.
- American Screw Co., Providence, R. I.
- Blake & Johnson, Waterbury, Conn.
- Haskell, Wm. H. Co., Pawtucket, R. I.
- Port Chester Bolt and Nut Co., New York, N. Y.
- Russell, Burdall & Ward, Port Chester, N. Y.
- Sternberg, J. B. & Son, Reading, Pa.
- Wilson, J. Fred., Worcester, Mass.
- Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Stones.**
Pike Mfg. Co., Pike Station, N. H.
- Oil Stoves.**
Glaizer Stove Co., Chelsea, Mich.
- Ores.**
Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
Scranton Forging Co., Scranton, Pa.
- Woodruff, Walter W. & Sons, Mt. Carmel, Conn.
- Packing.**
Billington, Jas. H. & Co., Phila., Pa.
- Morris, Robt., St. Louis, Mo.
- N. Y. Belting & Packing Co. Ltd., N. Y.
- Padlocks.**
Ames Sword Co., Chicopee, Mass.
- Fraim, E. T., Lancaster, Pa.
- Hillebrand & Wolf, Phila., Pa.
- Miller Lock Co., Philadelphia, Pa.
- Paint.**
Detroit Granite Mfg. Co., Detroit, Mich.
- Dixon Jos. Crucible Co., Jersey City, N. J.
- Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**
Dangler Stove & Mfg. Co., Cleveland, O.
- Patent Solicitors.**
Ashley, J. A., Washington, D. C.
- Fitzgerald, S. C., Washington, D. C.
- Howson & Howson, Phila. & Washg'ton, D. C.
- Jenner, H. W. T., Washington, D. C.
- Stocking, E. B., Washington, D. C.
- Perforated Metal.**
Clinton Wire Cloth Co., Clinton, Mass.
- Harrington & King Perforating Co., Chicago, Ill.
- Phosphor Bronze.**
Phosphor Bronze Smelting Co., Limited, 612 Arch, Philadelphia.
- Phosphor Tin.**
Crescent Phosphorized Metal Co., Philadelphia, Pa.
- Crosby Steam Gauge & Valve Co., Boston, Mass.
- Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
Houston, C. B. & Co., Philadelphia, Pa.
- Mann, Edwin R., Philadelphia, Pa.
- Montour Iron & Steel Co., Danville, Pa.
- Naylor & Co., 45 Wall, N. Y.
- Pickands, Brown & Co., Chicago, Ill.
- Pilling & Crane, Philadelphia, Pa.
- Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
Vulcan Iron Wks., Chicago, Ill.
- Pipe, Bent.**
National Pipe Bending Co., New Haven.
- Pipe Cutting and Threading Machines.**
Bjorkman & Keeler Mfg. Co., St. Louis, Mo.
- Merrill Mfg. Co., Toledo, O.
- Franklin & Maulie, Philadelphia.
- Saunders' Sons, D., Yonkers, N. Y.
- Pipe Grates.**
Freight Line Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.
McNab & Harlan Mfg. Co., N. Y.
- Pipe, Water and Gas.**
Makers of.
Cumberland Nail & Iron Co., Phila., Pa.
- Donaldson Iron Co., Emmaus, Pa.
- Riverside Iron Works, Wheeling, W. Va.
- Pipe Irons.**
Manufacturers of.
Buck Bros., Millbury, Mass.
- Pipes, Manufac-tures of.**
Stanley Rule & Level Co., N. Y.
- Plate Bending Rolls.**
Schneekloth, H. A., 530 W. 28th St., N. Y.
- Plate, Iron and Steel, Mfrs. of.
Enka-Standard Iron & Steel Co., Bridgeport, Conn.
- Lukens Iron & Steel Co., Coatesville, Pa.
- Moorehead-McLean Co., Pittsburgh, Pa.
- McIlvain & Sons, Reading, Pa.
- Pottstown Iron Co., Pottstown, Pa.
- Pottsville Iron & Steel Co., Pottsville, Pa.
- Ginger, Nimick & Co., Pittsburgh, Pa.
- The Mahoning Valley Iron Co., Youngstown, O.
- Weilman Iron & Steel Co., Thurlow, Pa.
- Wood Van Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
Angus, C. H., Albany, N. Y.
- Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Plumbago.**
Chicago Fdy. Supply Co., Chicago, Ill.
- Plows.**
Ross, A. M. & Co., Ilion, N. Y.
- Pokers and Lifters.**
Troy Nickel Works, Troy, N. Y.
- Polishing Machines.**
Watson & Stillman, 204 E. 43d, N. Y.
- Polishing Wheel.**
La Massena, C. E. & Co., Newark, N. J.
- Post Hole Diggers.**
Gibbs Mfg. Co., Canton, Ohio.
- Graham, John H. & Co., 113 Chambers St., New York.**
- Kohler, F. E. & Co., Canton, O.
- Wister, L. R. & Co., Philadelphia, Pa.
- Poultry Netting.**
Bartram, E. T., Detroit, Mich.
- Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
- N. Wire Cloth Co., Trenton, N. J.
- "Silver Finish."
- Tyler Wire Wks. Co., W. S., Cleveland, O.
- Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
Lafin & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.
- Powder Hack Saws.**
Miller's Falls Co., 93 Reade St., N. Y.
- Stover Novelty Wks., Freeport, Ill.
- Powder Hammers.**
Bradley & Co., Syracuse, N. Y.
- Belden Mach. Co., New Haven, Conn.
- Dienelt & Eisenhardt, Philadelphia.
- Dupont Mfg. Co., St. Johnsbury, Vt.
- Jenkins & Linglie, Bellfonte, Pa.
- Presses, Dies, &c.**
E. W. Bliss Co., Brooklyn, N. Y.
- Crosby, G. A. & Co., Chicago, Ill.
- Stark Mch & Tool Co., Buffalo, N. Y.
- Stiles & Parker Press Co., Brooklyn, N. Y.
- Waterbury Mch. Co., Waterbury, Conn.
- Presses, Power, Makers of.**
Bliss, E. W. Co., Brooklyn, N. Y.
- Katon, Geo. H. & Co., Boston, Mass.
- Manville, E. J. Mch. Co., Waterbury, Ct.
- Merriman, A. H. Meriden.
- Stark Mch. & Tool Co., Buffalo, N. Y.
- Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.
- Pulleys.**
Keystone Clutch & Mch. Wks., Phila., Pa.
- Pulverizing Mill.**
Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**
Jenks Bros. Steam Pump Works, In Goulds Mfg. Co., Seneca Falls, N. Y.
- Manapouli, Ind.
- Motowian, J. H. & Co., Cincinnati, O.
- Malin, J. & Son Jersey City, N. J.
- Norwalk Iron Wks. Co., So. Norwalk, Conn.
- Southwark Fdy. & Mch. Co., Phila., Pa.
- Valley Pump Wks., Easthampton Mass.
- Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Pumps.**
Bellevue Pump Co., Bellevue, Iowa.
- Deming Co., Salem, O.
- Douglas, W. B. & Middletown, Conn.
- Mast, Foss & Co., Springfield, O.
- Wyers, F. E. & Bro., Ashland, O.
- St. Joseph Pump Co., St. Joseph, Mo.
- Punches and Shears, Hand and Power.**
E. W. Bliss Co., Brooklyn, N. Y.
- Cumberland Hdw. Co., Cleveland, O.
- Cockburn Barrow & Mch. Co., Jersey City, N. J.
- Crosby, G. A. & Co., Chicago, Ill.
- Eaton, Geo. H. & Co., Boston, Mass.
- New Doty Mfg. Co., Janesville, Wis.
- Schneekloth, H. A., 530 W. 28th St., N. Y.
- Stark Mch. & Tool Co., Buffalo, N. Y.
- Stiles & Parker Press Co., Brooklyn, N. Y.
- Wals & Roos, Punch & Shear Co., Cincinnati, Ohio.
- Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
- Watson & Stillman, 204 E. 43d, N. Y.
- Pails, Old and New.**
Hirsh, L. K., Chicago, Ill.
- Perry, W. H. & Co., Providence, R. I.
- Richards, J. B. & Co., Pittsburgh, Pa.
- Railway Supplies.**
Steele & Iron Co., Chicago, Ill.
- Rat and Mouse Traps.**
Burditt & Williams, Boston, Mass.
- Estey, W. S., 65 Fulton, N. Y.
- Ripley Mfg. Co., Unionville, Conn.
- Razors.**
Butcher, W. S., 135 Duane St., N. Y.
- Curley, J. & Bro., 6 Warren St., N. Y.
- Electric Cutlery Co., 113 Chambers, N. Y.
- Schmitz, E. Lothrop, 92 Reade St., N. Y.
- J. R. Torrey Razor Co., Worcester, Mass.
- Refrigerators.**
Challenge Corn Planter Co., Grand Rapids, Mich.
- Monroe Refrigerator Co., Lockland, O.
- Refrigerator Door Fasteners.**
Conroy, P. J. & Co., Philadelphia.
- Rivets.**
Blake & Johnson, Waterbury, Conn.
- Burden Iron Co., Tr. v. N. Y.
- Cobb & Drew, Plymouth, Mass.
- Henderson, Jas. S., 165 Greenwich, N. Y.
- Plymouth Mills, Plymouth, Mass.
- Sternbergh, J. H. & Son, Reading, Pa.
- Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
Adt, Jno. & Sons, New Haven, Conn.
- Roasters & Bakers.**
Matthai, Ing. & Co., Baltimore, Md.
- Rock Drills.**
Pennia. Diamond Drill & Mfg. Co., Birdsboro, Pa.
- Band Drill Co., 23 Park Place, N. Y.
- Rolling Mill Machinery.**
Birmingham Iron Fdy., Birmingham, Conn.
- Booth, The Lloyd, Co., Youngstown, O.
- Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
- Mahoning F'dry & Mch. Co., Danville, Pa.
- Morgan Construction Co., Worcester, Mass.
- Robinson-Res Mfg. Co., Pittsburgh.
- Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Trethewey Mfg. Co., Pittsburgh, Pa.
- Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Roll Lathes.**
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**
Booth, The Lloyd, Co., Youngstown, O.
- Chicago Foundry Co., Chicago, Ill.
- Garrison, A. Fdy. Co., Pittsburgh, Pa.
- Johnson Foundry Co., Johnstown, Pa.
- Seaman, Sleeth & Black, Pittsburgh.
- Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
- Roofing.**
Berlin Iron Bridge Co., E. Berlin, Conn.
- Boston Bridge Works, Boston, Mass.
- Cambridge Roofing Co., Cambridge, O.
- Cincinnati Corrugating Co., Piqua, O.
- Johns, H. W. Mfg. Co., 87 Malden Lane
- Rope.**
Travers Bros. Co., 107 Duane St., N. Y.
- Rope and Web Goods.**
Covert Mfg. Co., West Troy, N. Y.
- Covert's Saddlery Wks., Farmer, N. Y.
- Rope Hammers.**
Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
Lufkin Rule Co., Saginaw, Mich.
- Standard Tool Co., Athol, Mass.
- Stanley Rule & Level Co., 29 Chambers,
- Sad Irons.**
Universal Sad Iron Co., Milwaukee, Wk.
- Sand Paper.**
Bader, Adamson & Co., Phila., Pa.
- Sash Balances.**
Caldwell Mfg. Co., Rochester, N. Y.
- Pulman Sash Balance Co., Rochester, N. Y.
- Stewart & Baker, Rochester, N. Y.
- Sash Cords and Chains.**
Motley, Peter, Philadelphia, Pa.
- Sash Locks.**
Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**
Empire Portable Forge Co., Lansingburgh, N. Y.
- Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Pulley Marker.**
Skelly, J. W. & Son, Bristol, Conn.
- Sash Weights.**
Brown, E. E. & Co., Philadelphia, Pa.
- Sash Weight Fasteners.**
Skelly, J. W. & Son, Bristol, Conn.
- Saws, Makers of.**
Atkins, E. C. & Co., Indianapolis, Ind.
- Diston, Henry & Sons, Phila., Pa.
- Jennings, C. E. & Co., 97 Chambers, N. Y.
- National Saw Co., 96 Reade St., N. Y.
- Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**
Rohrer, F. E. & Co., Canton, Ohio.
- Taintor, F. Co., 84-88 Chambers, N. Y.
- Scales, Manufacturers of.**
Buffalo Scale Co., Buffalo, N. Y.
- Chadillon, John & Sons, 86-88 Cliff, N. Y.
- Scrapers, Roads.**
A. Steel Scraper Co., Sidney, Ohio.
- Kilbourne & Jacobs Mfg. Co., Columbus, O.
- Sidney Steel Scraper Co., Sidney, O.
- Screws, Door and Window.**
Queen Anne Screen Co., Burlington, Vt.
- Screw Cutting Machinery.**
Wiley Bros. & Co., Greenfield, Mass.
- Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
Brown, R. H. & Co., New Haven, Conn.
- Chantrell Tool Co., Reading, Pa.
- Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**
Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
American Screw Co., Providence, R. I.
- Blake & Johnson, Waterbury, Conn.
- Wm. H. Haskell Co., Pawtucket, Vt.
- Miles, F. S., 205 Quarry, Philadelphia.
- National Screw & Tack Co., Cleveland, Ohio.
- Reynolds & Co., New Haven, Conn.
- Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
Barnes, W. F. & John, Rockford, Ill.
- Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sythe Stones and Whetstones.**
Pike Mfg. Co., Pike Stn., N. H.
- Cleveland Stone Co., Cleveland, O.
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- Sheet Zinc.**
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Arias Tack Corporation.	12	Collin, Victor.	30	Henderson, James J. & Son.	83	McKinnon Dash & Hdwy. Co.	99	Taylor Iron & Steel Co.	24		
Avery Stamping Co.	1	Collins, W. S.	33	Henderson, James J. & Son.	88	Port Chester Bolt & Nut Co.	106	The Audubon Co.	64		
Baekes Wire Nail Co.	13	Conroy, P. J. & Co.	10	Hendrie Mch. Co.	68	Portsmouth Wrench Co.	102	Thomson Electric Welding Co.	24		
Babcock & Wilcox Co.	37	Continental Iron Works.	35	Hendrie Mch. Co.	72	Pottstown Iron Co.	20	Thomson-Houston Motor Co.	52		
Baeder, Adamson & Co.	70	Corning, Edw. & Co.	17	Hendrie Mch. Co.	74	Pottsville Iron & Steel Co.	17	Thibout, W. J.	95		
Banker & White.	76	Correspondence School of Mechanics.	46	Hendrie Mch. Co.	78	Power Planer Co.	44	Tichener, E. H. & Co.	31		
Bardsley, J.	91	Cotton, Barclay W. & Co.	17	Hendrie Mch. Co.	84	Pratt Whitney Co.	50	Tidwell, W. P. & Co.	107		
Barnes, C. K. & Co.	22	Covett Mfg. Co.	96	Henzler, M. C.	86&103	Prentiss Tool & Supply Co.	59	Trotter, J. H. Razor Co.	79		
Barnes, W. F. & John.	43	Covett Mfg. Co.	98	Henzler, M. C.	88	Presbrey Stove Linining Co.	73	Trotter, W. H. & Iron and Steel Hdwy. Co.	25		
Barnett, G. H.	77	Cox, Justice, Jr.	22	Herrick, J. A.	31	Pullman Sash Balance Co.	95	Trotter, W. H. & Co.	100		
Barnum, E. T.	9	Cross, Justice, Jr.	22	Herrick, J. A.	31	Q & C Co.	91	Troy Nickel Works.	79		
Bass Hdwy. & Mch. Works.	35	Cross & Speirs Mch. Co.	45	Herrick, J. A.	31	Randolph & Clowes.	31	Tucker & Dorsey Mfg. Co.	77		
Becker, Jno. Mfg. Co.	42	Crown Smelting Co.	3	Hertz, T. & Son.	4	Reading Hardware Co.	118	Tudor Iron Works.	28		
Beiden Mch. Co.	43	Cruikshank, D. B.	59	Higginan Hdwy. Co.	77	Reeves, Paul S.	114	Tyler Wire Works Co. W. S.	68		
Bellevue Pump Co.	73	Cumberland Nail & Iron Co.	18	Holmes, Booth & Haydens.	2	Bell, J. W.	20	Underhill, Clinch & Co.	78		
Bement, Miles & Co.	45	Booth, the Lloyd Co.	32	Holmes, Booth & Haydens.	2	Reliance Hdwy. Wks Co.	8	Union Hdwy. & Mch Co.	36		
Bemis & Call Hdwy. Tool Co.	100	Borden & Lovell.	16	Holmes & Edwards Silver Co.	82	Remington Arms Co.	82	Union Metallic Cartridge Co.	49		
Berger Bros.	100	Boston Bridge Works.	16	Holmes & Edwards Silver Co.	82	Rendell & Co.	11	Unity Door Check Co.	1		
Berlin Iron Bridge Co.	10	Boston Gear Works.	38	Holmes & Edwards Silver Co.	82	Richards, D. W. & Co.	61	Universal Sad Iron Co.	84		
Best, Fox & Co.	10	Boston Lock & Block Co.	97	Holmes & Edwards Silver Co.	82	Richardson, C. F. & Son.	74	Valentine, M. D. & Bro.	28		
Bethlehem Iron Co.	22	Bowdoin, L. & Son.	82	Holmes & Edwards Silver Co.	82	Richardson, J. H. & Co.	103	Valley Pump Works.	38		
Bettendorf Axle Works.	67	Bogert, John L.	64	Holmes & Edwards Silver Co.	82	Ridgewood Craig & Son.	54	Washburn, Clinch & Co.	78		
Bevin Bros. Mfg. Co.	84	Brown, Geo. E.	56	Holmes & Edwards Silver Co.	82	Ridge Bros. Testing Mch. Co.	41	Washburn, Hdwy. & Mch Co.	9		
Bifield Drill & Tool Co.	92	Bryant, Hermann & Co.	19	Holmes & Edwards Silver Co.	82	Ripley Mfg. Co.	30	Van Dorn Iron Works Co.	9		
Bicycle Step Ladder Co.	92	Brown, R. H. & Co.	60	Holmes & Edwards Silver Co.	82	Riverside Iron Works.	20	Van Wagoner & Williams Co.	114		
Bigelow, C. R.	60	Cushman Chuck Co.	49	Holmes & Edwards Silver Co.	82	Roberts, A. & P. & Co.	20	Victor Mfg. Co.	95		
Bignal & Keeler Mfg. Co.	47	Dallett, Thos. H.	51	Holmes & Edwards Silver Co.	82	Robertson, Frank C. & Co.	33	Vulcan Iron Works.	33		
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Bingham, W. & Co.	104	Crossett, M.	92	Horton, Son & Co.	49	Rogers, The Wm. Wm. Mfg. Co.	82	Wallace, Wm. H. & Co.	22		
Birmingham Iron Hdwy.	25	Crosby, G. A. & Co.	43	Hotchkiss, E. S.	87	Rollason Gas Engines.	36	Waltham Emery Wh. Co.	56		
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Boone, W. C. Mfg. Co.	24	DeKalb Fence Co.	97	Hunt, Robert W. & Co.	64	Morgan Spring Co.	4	Waterbury Machine Co.	48		
Booth, the Lloyd Co.	32	Deming Co.	11	Jackson, Jerome & Co.	43	Morrison, Robert.	33	Watson & Stillman.	44		
Borden & Lovell.	16	Deming Co.	51	Jenkins Bros.	1	Morse, Williams & Co.	51	Webster, Warren & Co.	34		
Borden, Cyrus.	28	Desirer, E. & Co.	91	Jenkins Bros.	1	Morton, Thos.	94	Weiland Chas.	62		
Boston Bridge Works.	16	Detrick & Harvey Mch. Co.	53	Jenkins Bros.	1	Moseley Iron Bridge & Roof Co.	16	West Coxsackie Iron Hdwy.	32		
Boston Gear Works.	38	Detroit Cork Screw Co.	82	Jennings, C. E. & Co.	114	Motley, Peter.	96	Western Wheel Wks.	85		
Boston Lock & Block Co.	97	Detroit Fdry. Equip. Co.	28	Jessop, Wm. & Sons.	18	National Horse Nail Co.	99	Wetherhill, Robt. & Co.	113		
Box, Alfred & Co.	52	Diamond State Iron Co.	98	Jessop, Wm. & Sons.	18	National Pipe Bending Co.	34	White, L. I. J. Co.	79		
Bradford Mill Co.	52	Detroit Graphite Mfg. Co.	28	Jones, H. W. Mfg. Co.	21	National Saw Co.	74	Whitney, Mfg. Co.	95		
Bradley & Co.	17	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Screw & Tack Co.	12	Whitney, A. R. & Co.	18		
Bradley & Co.	113&56	Detroit Graphite Mfg. Co.	28	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Whitney, A. S. & Sons.	22		
Brass Goods Mfg. Co.	51	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Whitney, D. M. & Co.	49		
Bridgeport Chain Co.	83	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Whitwick Bros.	7		
Bridgeport Hdwy. & oxidized Bronze & Metal Co.	11	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilcox & Howe Co.	96		
Bridgeport Hdwy. & Mch. Co.	6	Dickson, H. & Elsenehardt.	45	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilcox & Russel Mfg. Co.	48&114		
Brown, E. & Co.	97	Detroit Graphite Mfg. Co.	28	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilkie, Bothwell & Co.	30		
Brown, Hoisting & Conveying Machine Co.	39	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Williams, J. H. & Co.	100		
Brown, R. H. & Co.	70	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Williams, C. T. Wire Co.	113		
Brown & Sharpe Mfg. Co.	58	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Williamsport Wire Rope Co.	113		
Bryden Horse Shoe Co.	98	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilmot & Hobbs Mfg. Co.	6		
Buchanan Fence Co.	9	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilson, E. H. & Co.	1, 3&114		
Buck Bros.	56	Diamond State Iron Co.	98	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilson, E. H. & Co.	18		
Buckeye Engine Co.	35	Dumont Mfg. Co.	42	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilson, J. John.	78		
Buffalo Forge Co.	66&114	Dwight Slate Machine Co.	18&28	Jones, H. W. Mfg. Co.	21	National Tack Co.	12	Wilson, J. Fred.	107		
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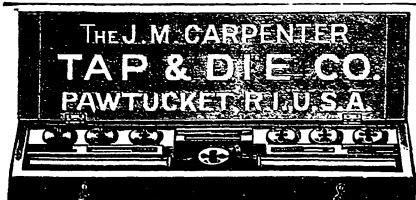
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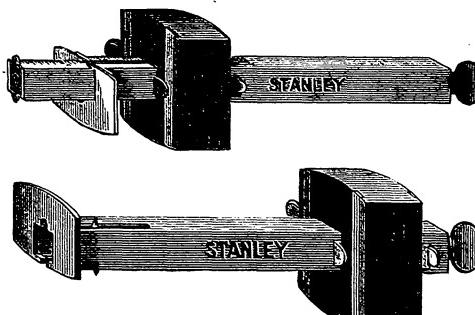
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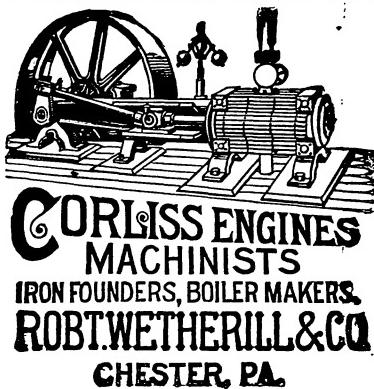
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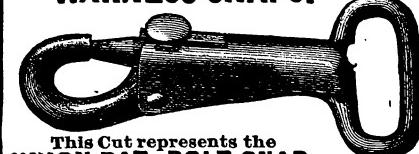
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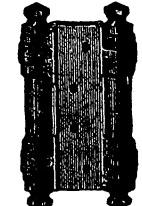
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THE IRON AGE

THURSDAY, MAY 25, 1893.

The Lodge & Shipley Cylinder Boring Machine.

The bed of this machine, which is made by the Lodge & Shipley Machine Tool Company of Cincinnati, Ohio, is one casting to the spindle bearings and to the separate ways upon which the boring slide and pillow block move. Power is taken from a $3\frac{1}{4}$ -inch belt on a 4-step cone on the main shaft, which is short and rigidly supported. The transmission of power to the main spindle is by a series of four gears. The cone pulley makes 30 revolutions while the spindle makes one. Power is taken for the feed from the main shaft by a pinion, transmitted to a spur gear keyed on a short shaft, and on which shaft are two pinions, either of which may

be keyed to the shaft by means of the lower lever shown. Power is transmitted through either one of these two pinions, both of which run loose on their shaft, and by one of the latter to either of two gears which may be keyed to their shaft by means of the upper lever shown. Four feeds are thus obtained. These latter gears transmit power to a steel worm on their shaft, which in turn meshes with a large worm wheel, which, by means of ample friction, transmits the power through a cross shaft and a pair of miter gears on the back side of machine to a horizontal shaft parallel to the bed and through it, and another pair of bevel gears, the second of which is keyed to cross shaft, on which is a pinion engaging in the rack of tail slide. This pinion and rack are both steel. The bearing slide is 4 feet long, has a movement of 4 feet and has bearing its entire length; it is bored to receive bronze rings which form a bearing for the boring bar. The boring bar may be located at any point and locked to the boring slide by means of the split collar shown. The main spindle through which this bar passes

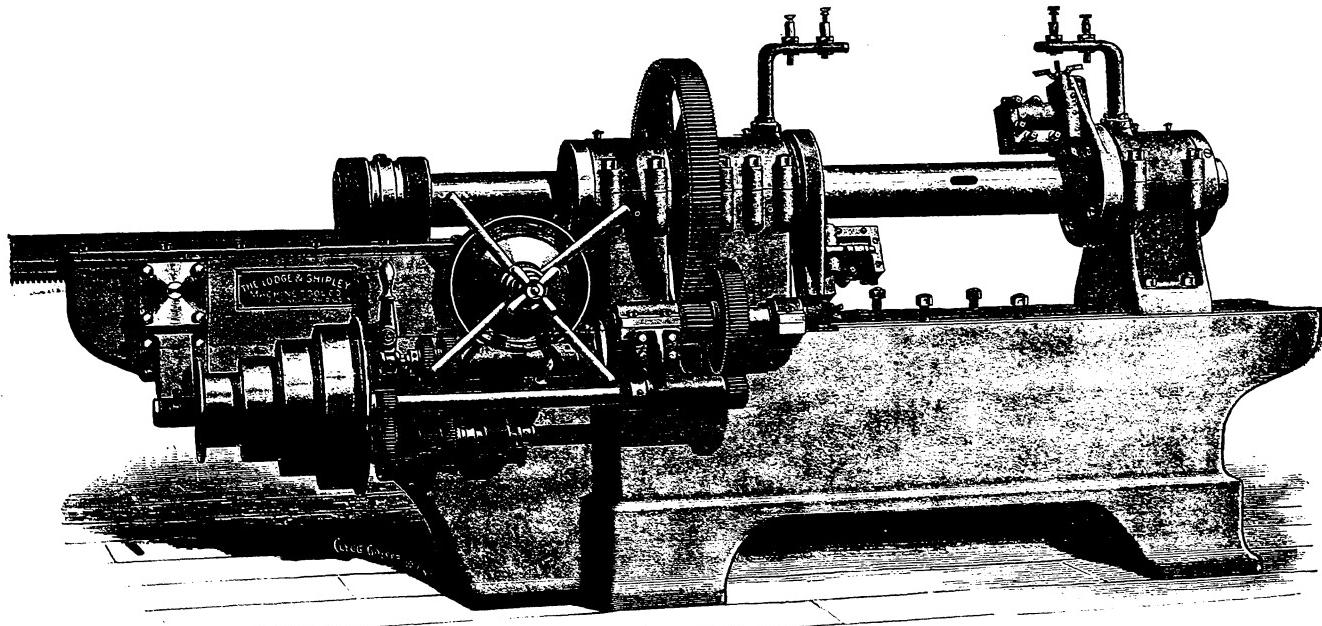
is fitted with heavy key and drives the boring bar by means of a spline which runs its entire length.

The length of the bed from the head stock to the end is 4 feet. The ways upon which the pillow block moves are 3 feet 8 inches long. The bed is $18\frac{1}{2}$ inches wide. The live spindle is $8\frac{1}{2}$ inches in diameter and rests in a scraped bearing in the head stock. This bearing is provided with ample oil chambers. The spindle is 21 inches long, front bearing $8\frac{1}{2} \times 9$, back bearing $8\frac{1}{2} \times 8$, and is bored $5\frac{1}{2}$ inches hollow. To the nose of the spindle is fastened a tool block, with star feed, which is susceptible of 4 inches feed to and from the center and an outward adjustment of $1\frac{1}{2}$ inches to or from the cylinder. The two steel buttons shown for tripping the star feed are made to reverse

for recent years. The tonnage of vessels ordered, but not yet laid down, is also much less than usual, amounting to barely 120,000 tons, as against 300,000, which has been, until recently, about the average amount for this season of the year. The situation is far from promising for British shipbuilders, although it may afford encouragement to the shipowners.

The Gatling-West Rifle.

A Gatling gun has arrived at Buffalo, N. Y., and stands in the office of George M. Bailey, one of the investors interested in the new town of Gatling, where the immense Gatling gun plant is to be located. The gun was brought on that local investors might be able to inspect



THE LODGE & SHIPLEY CYLINDER BORING MACHINE.

be keyed to the shaft by means of the lower lever shown. Power is transmitted through either one of these two pinions, both of which run loose on their shaft, and by one of the latter to either of two gears which may be keyed to their shaft by means of the upper lever shown. Four feeds are thus obtained. These latter gears transmit power to a steel worm on their shaft, which in turn meshes with a large worm wheel, which, by means of ample friction, transmits the power through a cross shaft and a pair of miter gears on the back side of machine to a horizontal shaft parallel to the bed and through it, and another pair of bevel gears, the second of which is keyed to cross shaft, on which is a pinion engaging in the rack of tail slide. This pinion and rack are both steel. The bearing slide is 4 feet long, has a movement of 4 feet and has bearing its entire length; it is bored to receive bronze rings which form a bearing for the boring bar. The boring bar may be located at any point and locked to the boring slide by means of the split collar shown. The main spindle through which this bar passes

the same, so that the tool block may move either to or from the center. The boring bar is $5\frac{1}{2}$ inches in diameter. The pillow block has an $8\frac{1}{2}$ -inch spindle revolving in it, with key to engage the boring bar. On the face of this spindle is a similar tool block to the one described on the live spindle. This machine is furnished with one chuck for holding cylinders. All set screws are hardened, as are all parts subject to heavy wear. The weight is about 6000 pounds.

The present year is marked by a very considerable falling off in the British shipbuilding industry. This decrease is shown in the following figures, which give the tonnage under construction at the end of the first quarter of a number of recent years:

1881	843,000 tons.
1882	1,264,000 tons.
1884	124,000 tons.
1892	813,000 tons.
1893	621,000 tons.

It is thus evident that the average of vessels under construction at the present time is much less than the usual average

it. It is one of the original models of the Gatling small calibre rapid-firing machine guns, such as are now used by nearly every nation in the world. It is made by the Gatling Machine Gun Company of Hartford, Conn., which is not connected, however, with the new Gatling Ordnance Company that propose to cast heavy steel cannon in the suburb of Buffalo named after the famous gun. The Gatling Company of Hartford have \$250,000 capital stock, but own no plant. As the orders for this class of guns are somewhat intermittent the concern have had difficulty in keeping skilled mechanics employed all the year, and consequently have had their work done by the Colt Arms Company. Both Mr. Bailey and Dr. Gatling are anxious to secure the manufacture of the small gun also at Gatling, in order to concentrate the industry. To meet the difficulty of providing steady employment for skilled mechanics, Mr. Bailey has secured options on the patents of a new magazine rifle recently invented by D. S. West of Boston, Mass. It is somewhat like the Winchester, but is said to be more rapid

and have newer features. It shoots 145 rounds without reloading, and discharges and ejects the cartridges as rapidly as the trigger can be pulled. One concern has given the inventor a standing offer for 10,000 of his rifles a year as soon as he can make arrangements for their manufacture. Dr. Gatling has made a few improvements on the patents of Mr. West, and the gun will be known as the Gatling-West rifle. Having secured an option on a controlling interest in the Gatling Machine Gun Company, Mr. Bailey proposes to urge the manufacture of the gun and that of the Gatling-West rifle, thus providing steady employment for the workmen to be placed in the plant. He will then put the stock on the market, and, a sufficient quantity being disposed of, will begin the manufacture of rapid-firing guns, magazine rifles and heavy cannon at Gatling.

The Gatling Construction Company have been organized for the erection of dwellings and other buildings in the new town. The capital stock is \$50,000, and the incorporators are: Henry S. Hill, Walter G. Hopkins, James N. Byers and Herbert H. Embry.

Tungsten Steel.

During the course of the discussion of the report of the Alloys Research Committee of the Institution of Mechanical Engineers, R. A. Hadfield of Sheffield is reported to have made the following statements in his remarks: Chromium and tungsten somewhat resemble each other, although varying considerably in atomic volume. These, again, have a somewhat different set of properties to those previously named. Tungsten is probably the stronger of the two as regards its influence in stiffening iron—that is to say, when added in comparatively large amounts. Copper comes outside these, giving a sort of superior silicon and aluminum steel. The malleability of a copper alloy ceases at about 3 to 3½ per cent., whereas silicon and aluminum will each take about 1 per cent. more than this before ceasing to be malleable. From the results obtained in the speaker's own experiments, it certainly seemed to him difficult to define the precise effects produced on the mechanical properties of iron in the testing machine with alloys of small amounts of added elements. He has lately made some tungsten experiments which probably would be of interest, as the atomic volume of this element is 9.6—that is, but little lower than aluminum and much higher than iron (7.2). With a very thin sample containing 1½ per cent. of tungsten and about 0.2 per cent. of carbon, quenched very rapidly, he had been able to scratch glass. But, notwithstanding this, he thought that tungsten had similar effects to chromium. This was an important fact, as both chromium and tungsten have atomic weights above that of iron, and should, therefore, according to the theory advanced in the report, tend to soften iron. The following are the figures which Mr. Hadfield gave in connection with this matter:

C.	T.	Tensile strength.	Elongation.	Elastic limit.	Reduction of area.
Per cent.	Per cent.	Tons.	Per cent.	Tons.	Per cent.
0.18	0.10	22½	43.10	14½	65.46
0.18	0.38	23	44.95	16½	68.90
0.21	1.49	28½	36.90	19½	54.80

Mesaba Mines.

One of the interesting exhibits in the Mines and Mining Building at the World's Fair will be the Minnesota show of ores and minerals. Chief in this are the iron mines of the Vermillion and Mesaba ranges, lying north of and tributary to the city of Duluth. Especially noteworthy will be the ores from the new Mesaba range, a year ago scarcely known outside Duluth, and two years ago unknown even there. The reports from this range, both as regards the quantity of its ore and the ease of its mining, have led mining men everywhere to regard all that is done on the Mesaba with the deepest interest.

As showing what this range has done in so short a time the following, taken from the assay cards which will be attached to the exhibit, will be of wide interest, all the ores, except where otherwise specified, being a soft blue hematite:

	Iron.	Phos.	Silica.	Manga. nese.	Comb. water.
Lake Superior Iron Company: Location, section 31, town 58, 20.....	66.10	0.025	4.07	0.41	...
Mesabi Chief Iron Company: Section 23, 57, 22.....	66.58	0.016	2.83	0.61	...
Adams Mining Company: Section 31, 58, 17.....	65.40	0.031	1.61	0.88	4.28
Same mine	66.80	0.023	1.24	0.48	2.35
Lone Jack Iron Company: Section 9, 58, 17.....	64.39	0.013	3.91	0.33	3.45
Ronchela-Ray Iron Company: Section 9, 58, 17....	66.43	0.037	2.45	0.69	1.10
Same company: Section 17, 58, 17.....	67.10	0.017	2.18	0.22	0.87
Iron King Mining Company: Section 20, 58, 17....	66.50	0.031	1.95	0.46	1.86
Biwabik Iron Company: Section 16, 58, 17.....	68.21	0.030	1.65	0.25	...
Same company: Section 3, 58, 16.....	67.60	0.013	1.85	0.13	1.10
Commodore Iron Company: Section 9, 58, 17.....	65.50	0.007	2.31	0.56	1.61
Wyoming Iron Co.: Section 9, 58, 17.....	64.70	0.036	3.45	0.29	2.70
Bessemer Iron Company: Section 9, 58, 17.....	64.68	0.032	4.80	0.43	1.81
Cincinnati Iron Company: Section 3, 58, 16.....	65.60	0.021	3.40	0.32	2.88
Mountain Iron Company: Section 3, 58, 18.....	68.20	0.018	1.20	0.61	0.81
McKinley Iron Company: Section 8, 58, 16	64.70	0.014	5.98	0.13	0.68
Same mine...	65.75	0.009	4.63	0.11	0.48

The above mines are all on the Mesaba range and comprise probably about a third of the properties that are so far shown to be mines. The Vermillion range, also lying a short distance north of Duluth, sends the following samples:

Zenith Iron Company, at Ely.	Iron.	Phos.	Silica.	Manganese.
Pioneer Iron Company, at Ely.....	67.63	0.034	3.55	0.14

The Minnesota Iron Company, on the Vermillion range, who shipped last year nearly 500,000 tons of ore and will this season mine 600,000 tons, send a special exhibit of their own showing the six grades of ore they ship. Their first grade, "Minnesota," is sold under a guarantee of 66½ per cent. metallic iron and not over 0.025 phosphorus. The company will be able to show samples of their specular ore running between 69 and 70 per cent. iron. The Chandler Mine, at Ely, also makes a special exhibit. This company will this year

mine 700,000 and their ore body averages about 64 per cent. iron and is very low in phosphorus.

It is not to be supposed, of course, that these assays represent the average run of the ore body of the Mesaba range, for the samples are, in many cases, carefully selected by the mining companies, but they represent what the Minnesota iron mines are to-day at their best.

John Birkinbine, president of the Engineer's Club, in an address on Mexico, referred to some of the engineering features which impressed themselves upon him during a recent trip in that country, and contrasted the journey which he made by railroad and in sleeping cars with one covering a portion of the same territory made 11 years ago in diligences, and on horseback, noting the improvements made, but calling attention to the tenacity with which older methods and appliances are still adhered to. He referred to the difficulty in locating and constructing railroads in a country where the supplies and even the water had to be carried long distances, and instanced the necessity at present of some of the railroads attaching one or two tank-cars of water behind the locomotive tender so as to cross waterless plains of 100 miles or more. He states that of the 6881 miles of railroad in the Republic of Mexico, fully three-fourths are at elevations greater than are reached by any of our Pennsylvania railroads, and about one-half above a level of 5000 feet above tide, and one-half below that height; of the higher portion some 200 miles of the tracks are laid from 8000 to slightly over 10,000 feet above sea level. He described the general alignment and profiles of the various railroads, and illustrated this by diagram, referred to the difficulties of construction and cost of some of the roads and laid stress upon the liberal use of metal sleepers which meet with favor from engineers, managers and contractors. He also discussed the measures which had been taken in former times to drain the city of Mexico, and referred to the present canal and tunnel, the former requiring the handling of 12,000,000 cubic meters of earth. After discussing the existing conditions in Mexico, which lead many inventors astray, namely the cheap labor and high cost of fuel, reference was made to the numerous important aqueducts and the possibilities of irrigation being carried on upon a liberal scale by the erection of large dams on the mountains. The National Engineering College and its curriculum were mentioned and incidental reference was made to the large number of meteorites which have been discovered in Mexico, some of them of enormous size. One mass of meteoric iron, now at the museum of the college, is in two parts, the pieces weighing together about 25 tons. The address was illustrated by diagrams and also by lantern slides, showing some of the engineering structures, crude methods of handling used by the natives, and closed with some picturesque views of the mountains, and of the growth and manipulation of "pulque."

The West Point Foundry has completed five out of the 11 8-inch guns under contract for the Ordnance Department, and is now at work on the remaining six, which are to be delivered, commencing August 1, at the rate of one every three months.

The Battin Water-Tube Boiler.

A new boiler of the water-tube type, possessing several novel and interesting features, was invented recently by L. B. Battin of Elizabeth, N. J. From the drawings herewith presented, which convey a clear idea of its construction, it will be observed that the principal novelty is found in the frustum-shaped ends, placed one at each end of the tubes. These serve as reservoirs of water, and also as mud drums, since, owing to the comparatively large quantity of water they contain, the circulation is slow as compared with that through the tubes. In addition, the peculiar form of these heads avoids the weakness of flat ends, while their strength is such as to obviate the necessity of employing stay bolts.

One of these boilers of 100 horsepower is now in operation at the pumping station of the Plainfield Water Supply Company at Netherwood, N. J., and a description of it as it stands will

feet 8½ inches. Each head is connected with a steam dome, 24 inches in diameter, by oval necks 10 x 12 inches.

In order to equalize the volume of water circulating through all of the tubes, the lower ends of the 6-inch tubes are partly closed by wrought-iron plates, loosely adjusted, and held in position by the upward current of the water. A blow-off at the lowest part of each head has been provided so as to facilitate the discharge of sediment which will be deposited. In setting the boiler care has been taken to prevent flame from striking any part except the tubes. A row of tiles has been left out of the roof of the combustion chamber under the steam dome in order to heat the upper chamber containing the dome. In setting the boiler the rear head was inclosed in a hot-air chamber constructed of brick in a manner to leave free access through the manhole. Hot air passes into this chamber through the opening marked "cleaning door." A design for a front whereby the other head will also be in-

The Suez Canal.

The annual returns of shipping and tonnage making use of the Suez Canal for 1890, 1891 and 1892 have been communicated by the British Suez Canal directors to their Government. The directors observe in their introductory dispatch that the net tonnage for the past year shows a decrease of 986,748 tons compared with that of 1891, and an increase of 821,934 tons over that of 1890. The amount of dues has varied from 66,984,000 francs in 1890 and 83,422,101 francs in 1891 to 74,452,436 francs in 1892. The number of vessels which passed through the canal was 3389 in 1890, 4207 in 1891 and 3559 in 1892, of which 2522 in 1890, 3217 in 1891 and 2581 in 1892 carried the British flag. The returns for British, German and Italian vessels show a decrease in 1892 as compared with 1891. The French rate remains stationary, but there has been a considerable increase in the number of Dutch merchant vessels pass-

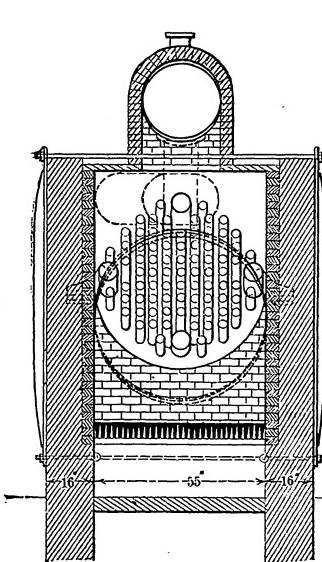


Fig. 1.—Cross Sectional Elevation.

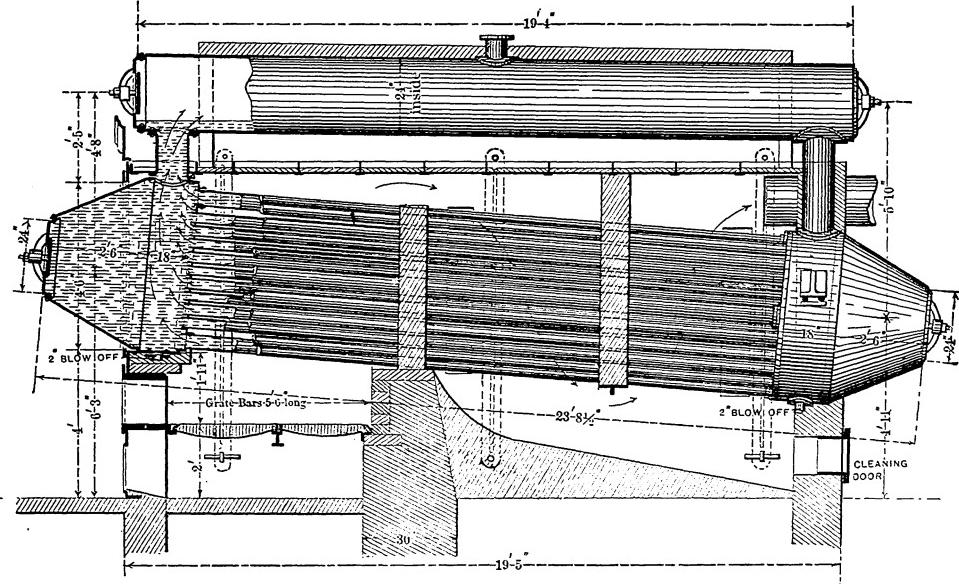


Fig. 2.—Longitudinal Sectional Elevation.

THE BATTIN WATER-TUBE BOILER.

best serve to explain what has been accomplished.

Each head of the boiler consists of a ring of steel 18 inches wide and 54 inches in diameter riveted to a frustum of the same material 30 inches long, 54 inches in diameter at the larger end and 24 inches in diameter at the smaller end. The smaller end is closed by a manhole plate. The interior of the head is closed by a tube sheet, in which 84 3½-inch tubes have been inserted and expanded and beaded on the inside. Besides the 3½-inch tubes four 6-inch lap-welded tubes have been inserted and riveted to each tube sheet by means of angle-iron ends. The object of the 6-inch tubes thus fastened to the ends is to give strength to the frame work of the boiler. The interior of each head seen from the manhole resembles the sectional view shown in Fig. 1. In actual construction, however, the tube sheets were turned one-eighth of the way around so as to "stagger" the tubes. By simply removing the manhole plate in the end of either frustum or reservoir ready access may be had to the interior for cleaning, repairs, or any other purpose. The length of the tubes is 16 feet, and the extreme length of the boiler is 23

closed in a hot air chamber has been completed, but not yet erected.

The boiler is constructed entirely of steel marked "Tensile strength, 60,000 pounds." No cast iron has been used in its construction. The advantages claimed for this boiler are simplicity of construction, strength and safety without a single stay bolt, ready access to all parts of the interior, and economy in the use of fuel. Besides, the boiler can be made in parts convenient for transportation, and readily erected at the place where it is to be used.

Although the boiler at Netherwood was, in a certain sense, of an experimental character, its successful operation has justified the formation of a company, the Water Tube Boiler Company of 68 Broad street, Elizabeth, N. J., to carry on its manufacture.

An interesting fact concerning the relative hardness of copper and zinc has been brought to light by means of Paul Jannetaz's new sclerometer. Most authors regard zinc as harder than copper. If, however, the metals are examined in a sufficiently pure state, it appears that copper is the harder of the two.

ing through the canal. The percentage of British flags passing through the Suez Canal in 1892 shows a slight decrease as compared with the previous year, 72½ per cent. carrying the British flag, as against 76½ per cent. in 1891. The percentage of German vessels has risen from 7.56 to 8.20, of French vessels from 4.07 to 4.89, and of Dutch vessels from 3.49 to 4.97, while the percentage of Italian vessels has sunk from 2.76 to 2.08. Of 2719 merchant vessels and vessels in ballast, of a net tonnage of 5,698,407 tons, passing through the canal, 2277, of a net tonnage of 4,964,816 tons, were British—that is, nearly 85 per cent. of the number and 87 per cent. of the tonnage; and 205, or 7 per cent., were German vessels, whose tonnage was 6.3 per cent. of the whole; France, Holland and Norway combined furnishing a total of 6.5 per cent. of the vessels and 5.1 per cent. of the tonnage of the carrying trade to the East through the Suez Canal.

Assistant-Secretary Hamlin has decided that terne plates manufactured from imported or smoothed or cold-rolled black plates are entitled to draw-back allowances.

Sinking Building Foundations by the Pneumatic Process.

The Manhattan Life Insurance Company are now erecting at 64, 66 and 68 Broadway, New York, what will undoubtedly prove to be not only one of

architects and engineers the work is attracting much attention, for the reason that the so-called pneumatic process of sinking a pier has been adopted, and the cantilever principle, so well known in bridge construction, has been employed in distributing the load of the columns proper over the piers formed by the caissons. This is the first time this construc-

upon which were superimposed mud and quicksand, making the use of piles out of the question. Owing further to the fact that on the south side is the north wall of the Consolidated Exchange, which rests on piles, and on the north side the wall of another smaller building, the foundations of which it became absolutely essential to support and pro-

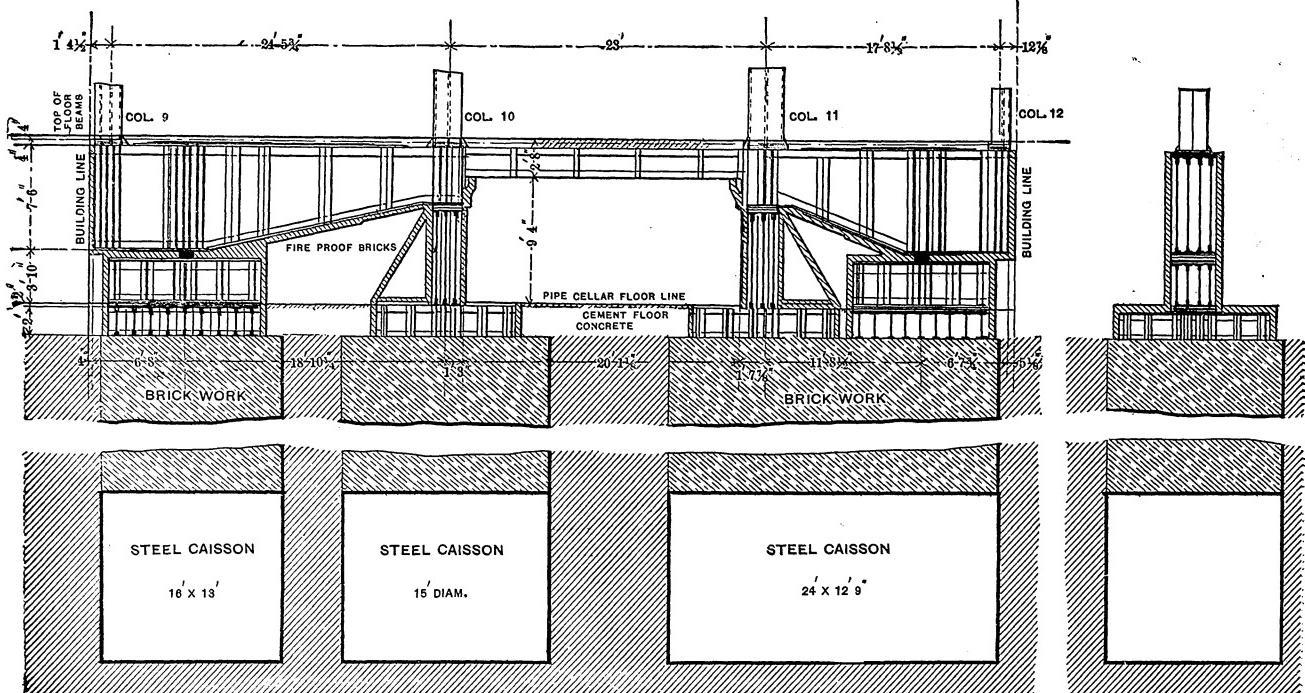


Fig. 1.—Cross Section through Cantilever and Caissons.

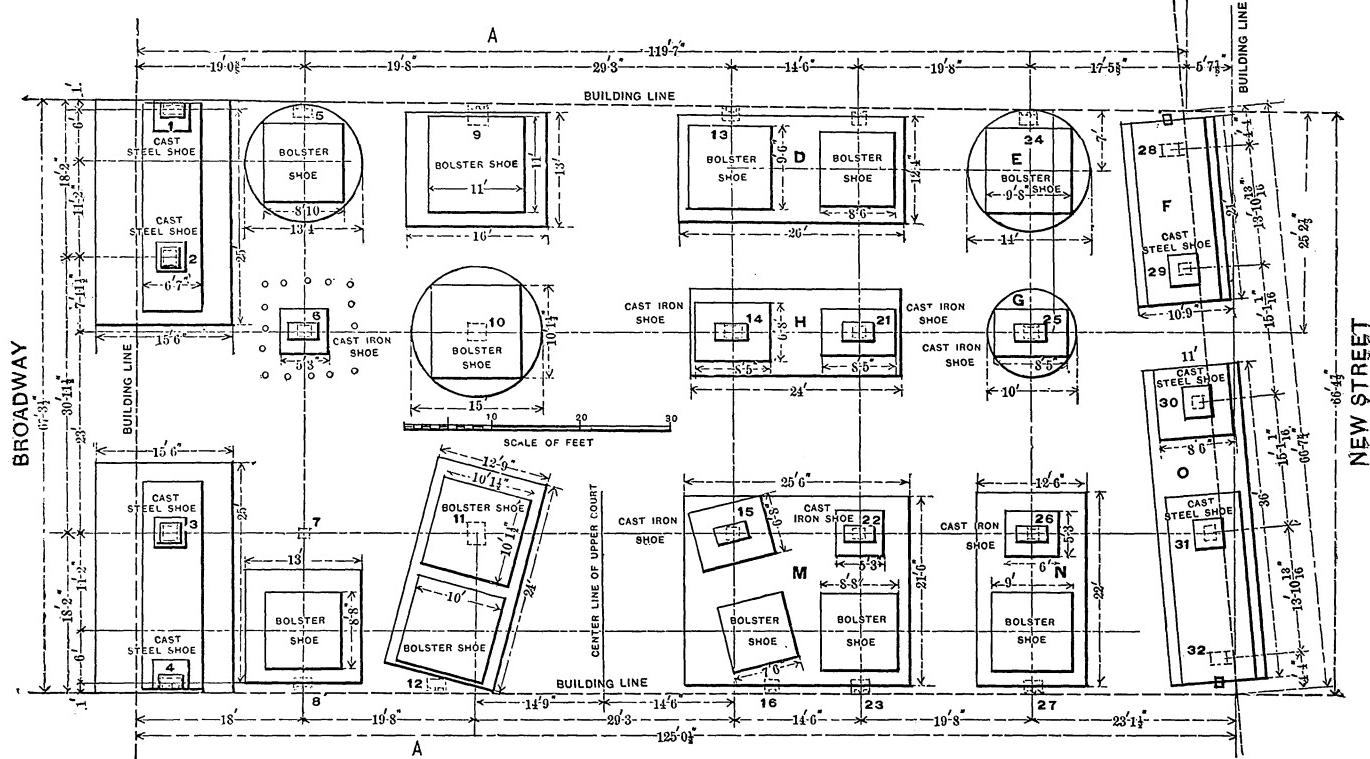


Fig. 2.—Plan Showing Location of Caissons.

SINKING BUILDING FOUNDATIONS BY THE PNEUMATIC PROCESS.

the most conspicuous office buildings in this country, but also in the world. On a comparatively small plat of ground they will place a building 348 feet from the curbstone to the foot of the flag staff, or 408 feet from the bottom of the foundation to the top, this being some 61 feet higher than Trinity Church spire, immediately across the street. From

tion has ever been employed for carrying down the foundations of a large building, although common enough in the construction of bridge piers and foundations in or near the water. Why it is so peculiarly adapted to this particular case will be understood when we say that at a distance of some 50 or 55 feet below Broadway there is a rock

bed during the sinking of the foundations for the new building, the ordinary open cut for the removal of all material lying upon the rock was out of the question. By the adoption of the pneumatic process it is possible to sink the piers to bed rock without disturbing in any way the material except a section equal exactly to the largest sec-

tion of the caisson going down. In addition, as the caissons are all made of steel, they can be sunk very near the building line, thereby serving practically to widen the base of the whole structure.

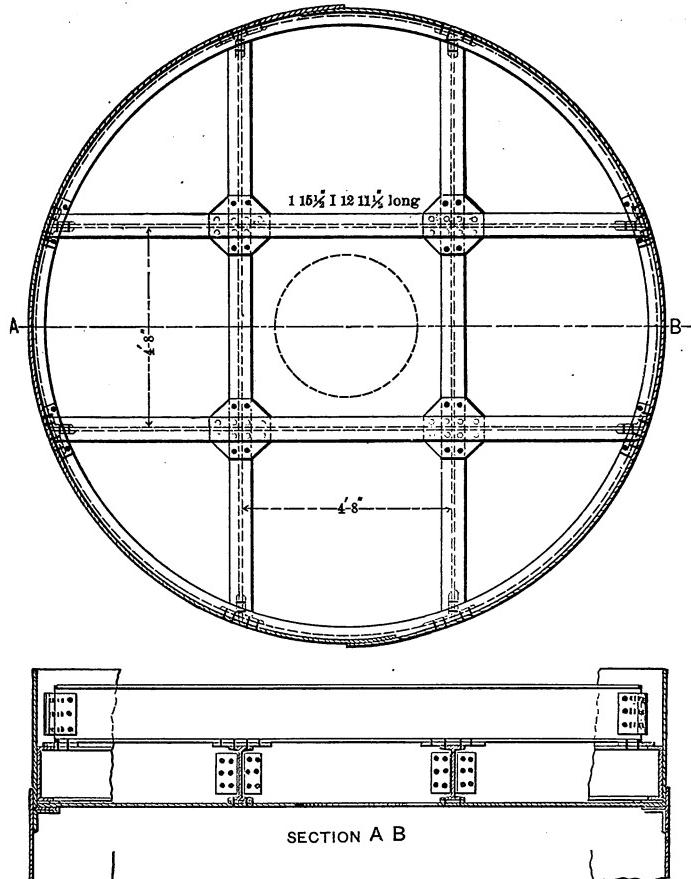
General Description.

The building is being erected after plans of the architects Kimball &

a height of 242 feet from the Broadway sidewalk to the top of the main roof and a height of 254 feet 4 inches on New street. Rising from the main roof on the Broadway front will be a tower, terminating in a dome, which will increase the height of the building from the Broadway curbstone to the foot of the flagstaff to 348 feet.

being richly ornamented. The spandrels of the arch outside are to have cartouches on which will be inscribed the date of the foundation of the company and erection of the building, together with the seal of the company. This part of the building will be the richest in ornamentation and detail. The other special features will be the sixth and seventh stories, which are designed to emphasize the location of the offices of the company and which will be specially marked by the recessed arcade and the projecting balcony. The officers' rooms look out on the balcony on the sixth story and the directors' rooms on the seventh story.

In the design the architects have aimed to preserve as much as possible a



Figs. 3 and 4.—Plan and Section through Roof of Caisson E.

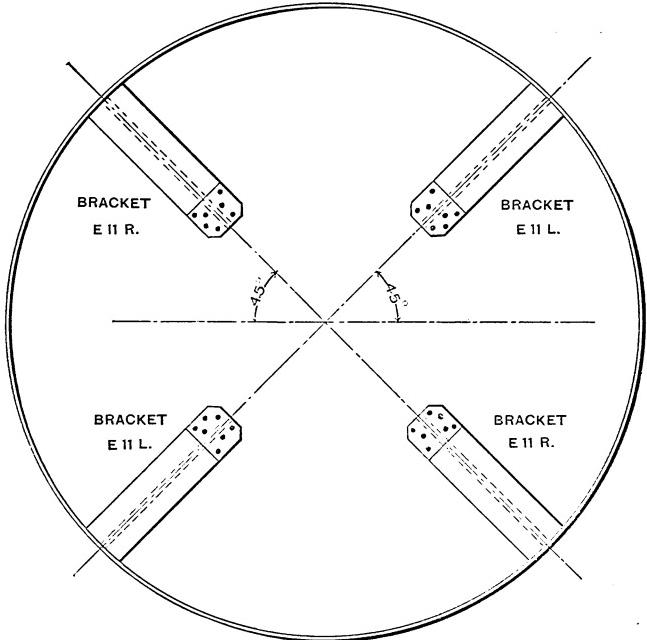


Fig. 6.—Roof Plan of Brackets of Caisson E.

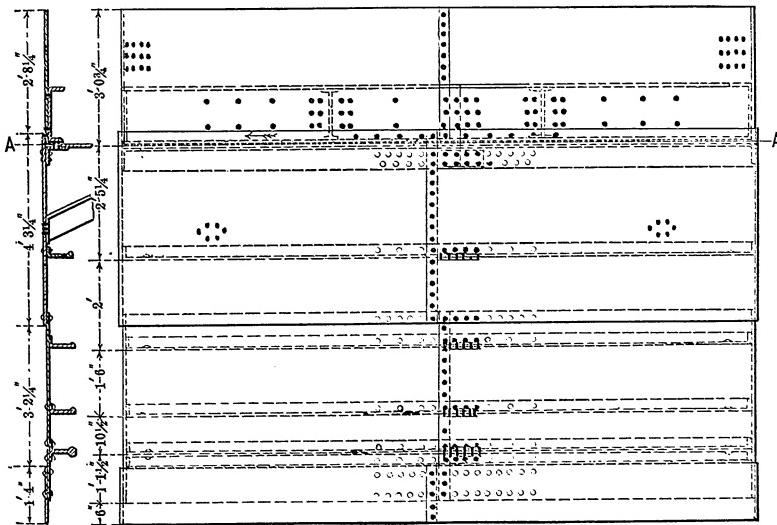


Fig. 5.—Side Elevation and Section of Caisson E.

SINKING BUILDING FOUNDATIONS BY THE PNEUMATIC PROCESS.

Thompson of 55 Broadway, New York. The frontage on Broadway is a trifle more than 67 feet, the depth on New street being 119 feet on the north line and 125 feet on the south line. The building proper is to be 16 stories high on the Broadway front and 17 stories high on the New street front. It will have

The style of the Broadway and New street fronts will be Italian Renaissance, richly ornamented. The special features of the Broadway front will be the arched doorway extending through two stories, with a recessed vestibule, also of stone, extending back in the building 18 feet, the sides and ceiling

solid and dignified character and to avoid excessively large openings. The front is unbroken from the sidewalk to the sixth story except by the large doorway. From the sixth story upward the front is more irregular and is marked by side pavilions, the central portion being slightly raised. These pavilions terminate in small domes above the main roof. At the level of the fourteenth story the front is retired from the front line of the building for the width of the central portion, and is carried back to the face of the tower, which stands in the rear of the front 7 1/2 feet. The inner line of offices are lighted from a large open court on the south side of the building, thus giving every office abundant light and air. On the sixth floor there is a spacious rotunda, two stories in height, with a domed ceiling richly decorated in relief. This rotunda is designed for the public entrance to the company's offices. There will be five hydraulic elevators for the use of the public and two electric elevators for the use of the company. Careful attention has been paid throughout to the fire-proof qualities of the building. There will be no metal work exposed to the action of fire, all being covered with fire-proof materials. All the staircases above the first story will be of marble and iron, and all the floors of halls and corridors will be laid in mosaic. For the special ventilation of the offices there will be a large chamber formed above the ceiling of all the corridors

and connected with ventilating shafts. Each office will be connected with this chamber by registers under the control of the tenant. At the head of each of the ventilating shafts there will be electric exhaust fans, supplying the motive power for the extraction and discharge of the vitiated air from the offices. The heating and power system will be supplied by three Scotch marine boilers, placed under the sidewalk on Broadway.

The Caissons.

In the accompanying drawings we illustrate more or less in detail the construction of the caissons and a ground plan showing their location, and a cross

the main loads and acting as supports for the masonry shell and also braces particularly intended to withstand strains due to wind pressure, there will be, all things considered, ample space on the ground floor.

The idea of the employment of caissons in this case and of the distribution of the load by means of cantilevers was first proposed by C. O. Brown, president of the Riverside Bridge & Iron Works, 61 Broadway, New York. Although Mr. Brown employed caissons in sinking some of the piers for the Fifth Avenue Theatre, they were small and were sunk by mechanical means, no air pressure being employed.

vation advances the caisson sinks, the air pressure in the inside being reduced slightly until the dead weight of the caisson itself and the masonry upon the top of it are sufficient to overcome the frictional grip or resistance due to the bearing upon the outside surface of the material that it is passing through. In some instances it is necessary to increase the dead load by piling pig iron on top. Entrance to the caisson is effected through the so-called air-lock, sometimes only one of which is employed and sometimes two, one being for men and one for material. This air-lock is a small chamber provided at each end with a door, these doors opening in-

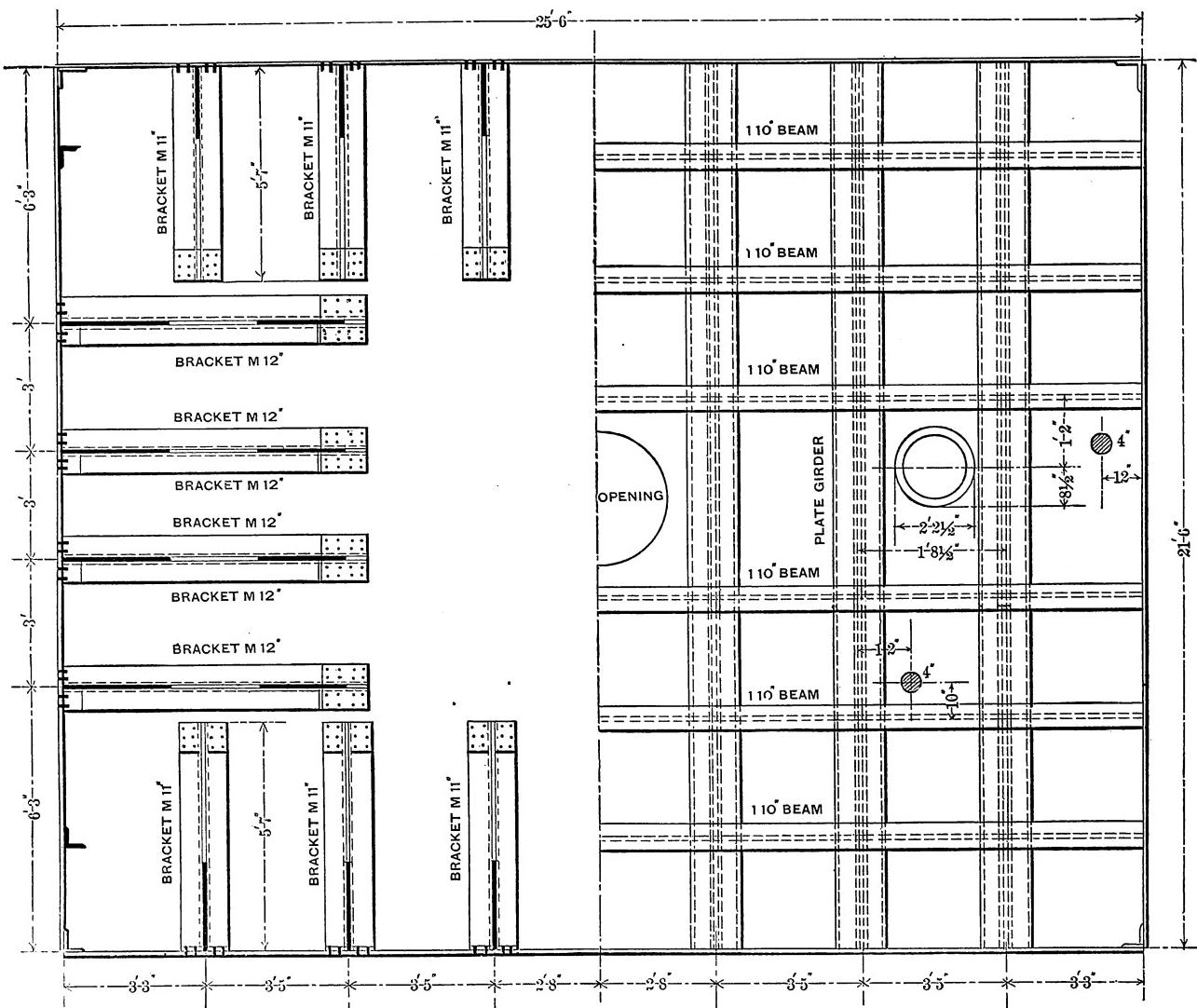


Fig. 7.—Sectional Plan of Caisson M.

SINKING BUILDING FOUNDATIONS BY THE PNEUMATIC PROCESS.

section, on the line A A of the plan, Fig. 2, of one of the cantilevers. It is, perhaps, not too much to say that a few years since it would have been impossible to have erected a building having the foundation load this will ultimately have on a site of this size without occupying so much of the space as to render the lower floors small and of insignificant value. But by carrying the foundation piers, as is here proposed, down to bed rock, the introduction of the cantilever principle for distributing the load over the several portions of the foundations formed by the caissons, and essentially the employment of skeleton steel frames serving to carry

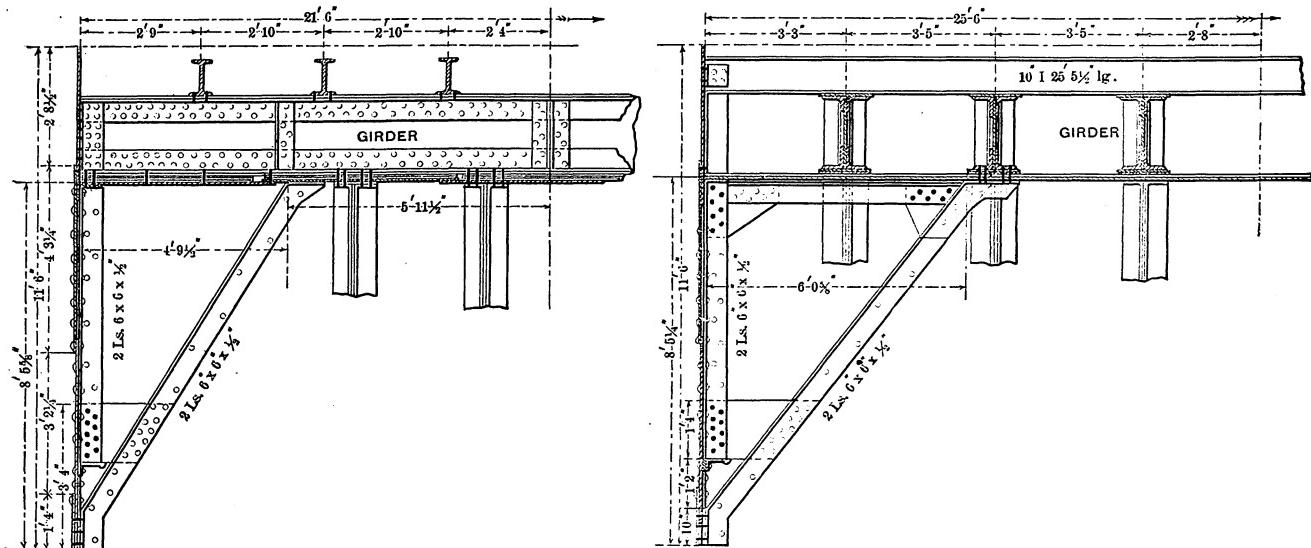
The caisson, considered as an aid in sinking foundations through wet material, consists of an inverted box having a sectional shape according to the work it is intended to do—sometimes circular, rectangular, square or irregular. The principle is that, as long as the air pressure in this box is maintained equal to or slightly above the water pressure upon the outside down to the shoe or lower edge of the caisson, it will be impossible for any water to enter. Work is carried on in the chamber formed by the caisson, in the vast majority of cases the work of laying the masonry on top of the caisson being carried along at the same time. As the work of exca-

wardly or toward the inside of the caisson. We will suppose that the inner door of the caisson is closed and the outer door open. The inner door of the caisson is firmly held in closed position by reason of the interior air pressure, which, it is not expected in the case of the caissons we are about to describe, will at any time exceed 12 or 15 pounds to the square inch, equal to about from 27 to 34 feet head of water. Entering the air-lock the outer door is then closed, and the air under pressure admitted through a suitable valve into the air lock. As soon as an equilibrium has been established—that is, when the air in the air-lock has become of the

same pressure as that in the caisson—it is evident that the pressure on the inner door will be equal on both sides and it can be opened, the outer door then preventing the escape of the air under pressure. The reversal of this operation, of course, permits of the passage from the caisson through the air-lock to the outside, in the latter case the air under

relation to the caissons, the columns being numbered beginning at the upper left-hand corner and going down and then returning to column 5. It will be observed that the caisson shown at column 12 is arranged obliquely. This is done in order that the cantilever, which is shown in cross sectional elevation in Fig. 1, may provide for the

side plates are $\frac{1}{2}$ inch steel, the side being formed with lap joints, as shown in Fig. 3, two lengths being used to make the circle. The side elevation and vertical central cross section are shown in Figs. 5 and 4 respectively, Fig. 6 indicating very clearly the brackets arranged to bind the roof and sides together. Arranged at right



Figs. 8 and 9.—Brackets M 11 and M 12 of Caisson M.

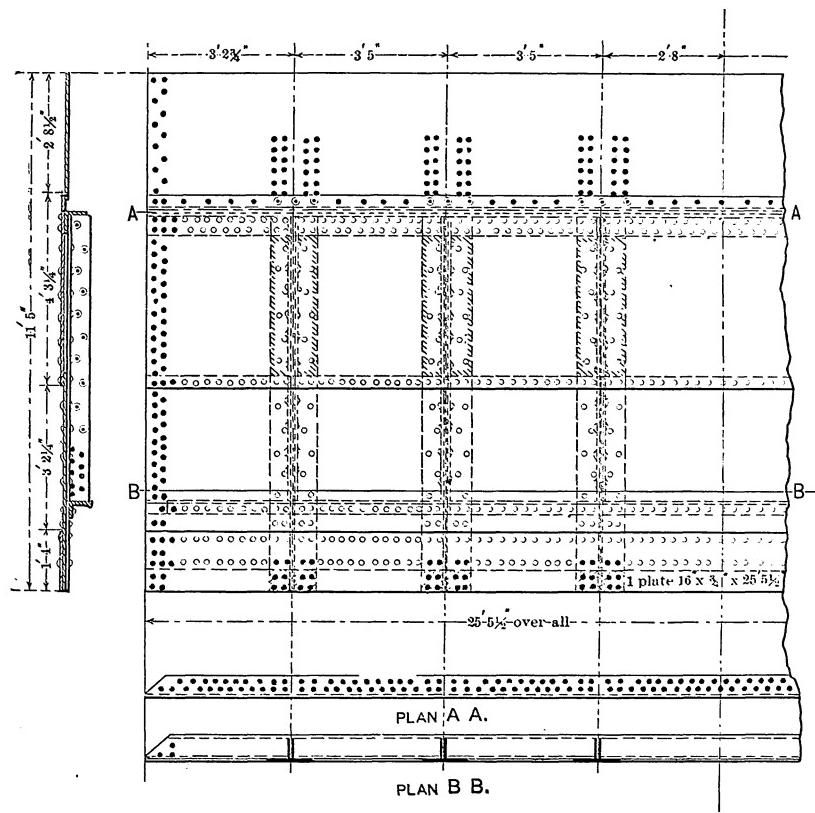


Fig. 10.—Side Elevation and Sections of Caisson M.

SINKING BUILDING FOUNDATIONS BY THE PNEUMATIC PROCESS.

pressure in the air-lock being permitted to escape into the atmosphere.

After the caissons have been sunk to bed rock they are cleaned out and filled with concrete, thus forming a continuous masonry pier from the rock up to the surface of the ground. The 15 caissons are arranged as shown in the plan view, Fig. 2, which also gives the locations of the steel columns and their

proper distribution of the load carried by the columns 9 to 12 over the foundations. Details of construction of the caissons marked E and M are shown in Figs. 3 to 10. The circular caisson is 14 feet in diameter and of a height of 8 feet 8 inches. The top is formed of steel plates $\frac{1}{2}$ inch thick, and in the center is a circular opening for the air-lock, 3 feet $1\frac{1}{2}$ inches in diameter. The

angles across the top are two sets of channel beams, as shown in Figs. 3 and 4, and which serve not only to stiffen the roof, but also to bear the load of masonry erected upon it during the sinking.

The details of construction of the caisson M, which measures 24 feet one way by 12 $\frac{1}{2}$ feet the other, are very clearly brought out in the drawings from 7 to 10, Fig. 7 being a sectional plan, one half of which shows the system of bracketing and the other half shows the top girders, which are also shown in vertical section and elevation in Figs. 8 and 9.

Column Supports.

The 32 columns carrying the building are arranged as shown in the plan view. It is essential that the load should be brought to the center of the top of each pier. Bolster shoes, the form and position of which are clearly shown in the plan, were adopted by Mr. Brown. These bolsters consist of two systems of girders arranged at right angles to one another and upon the center of the top of which rests the cast-steel shoe of the column. The construction of these girders is very plainly brought out in Fig. 1. It is evident that this method provides for the equal distribution of the weight over the entire base of the pier, preventing thereby any one section from carrying more than its share of the load.

Cantilevers.

The cantilever, through columns 9, 10, 11 and 12, reference being had to Figs. 1 and 2, is shown in side elevation in Fig. 1, which also shows the relative location of the three caissons carrying this particular structure. These cantilevers consist of a system of plate girders arranged in box form, as shown in the cross sectional view to the right of Fig. 1. The center of the bracket, as shown to the extreme left in Fig. 1, has an extreme height of 7 feet 6 inches. It should be particularly noted that the columns at the ends of the cantilever

are on the building line, with the exception of space sufficient for the insertion of fire-proofing bricks, which in the drawing, Fig. 1, are indicated by the hatched surfaces. The inner ends of the two brackets of the cantilever are united by a connecting bridge of plate girders 2 feet 8 inches deep. The inner ends of the brackets carry the columns 10 and 11, the columns 9 and 12 being supported upon the outer ends. The load supported by the outer columns is transferred to the bolster shoes at the center at the points indicated in black, so that although both of the end columns are outside of the outside edges of their respective caissons, the load they bear is transferred by means of the cantilever and bolster shoes so as to be evenly distributed over the base of the piers formed by these caissons. The steel work for the caissons D, E, F, G, H, O, M, N was done at the works of the Riverside Bridge & Iron Works, Paterson, N. J., the other caissons being constructed by the Quintard Iron Works, New York, the work of sinking being performed by Sooysmith & Co. of the Mills Building, New York.

The Trethewey Mfg. Company.

A very successful manufacturing concern in Pittsburgh is the Trethewey Mfg. Company, whose business was established on Forty-ninth street in that city in 1883 by Samuel Trethewey, for the manufacture of roll-turning tools, shear knives and steam hammers. From the commencement of operations the firm met with a ready demand for their products, and in July, 1889, the business was removed to Forty-seventh street and A. V. R. R., where new and enlarged quarters had been secured. From the time of the removal to the last named location frequent additions to equipment and buildings were made in order to keep pace with the growing demand for their goods, and in March, 1890, the firm was changed into a corporation with officers as follows: Samuel Trethewey, president; S. Heppenstall, vice-president; F. Tinker, treasurer; J. B. Van Wagener, secretary, and Uriah Tinker, assistant secretary, and at the present time the firm have one of the most complete machine shop establishments in Pittsburgh. The machine shop is 43 x 136 feet in size, fully equipped with lathes, planers, slotted and other iron working tools, besides an additional building containing machines for various parts of the work closely associated with the products in the machine shop proper, and also blacksmith shop fully equipped—forge, pattern shop, pattern storage and tempering departments. The forge referred to above was added in 1891, giving the firm facilities for turning out forgings up to 6000 pounds in weight, and also for the manufacture of hardened forged steel rolls.

A specialty of the firm consists of the furnishing of dies up to any size required, and they are now at work on an order from Riter & Conley of Pittsburgh for dies to be used in cutting out steel vestibule plates for passenger cars, these plates being cut out of a solid piece of steel by hydraulic pressure, the die attachments alone weighing about 9 tons. Also under construction are a number of open-back steam hammers of their regular type, as well as an open-back special hammer for forging locomotive frames. The firm are just completing the building of a number of roll lathes which are claimed to be the largest ever turned out in this

country. These lathes have beds 25 feet long and will take in rolls up to 76 inches in diameter. They are so arranged that two will be placed together, so that a roll of any length may be turned. They are for shipment to Seaman, Sleeth & Black, proprietors of the Phoenix Roll Works at Pittsburgh. An important branch of the business is the manufacture of hardened forged steel rolls, shipments of which are being made right along to cold-rolled steel manufacturers in various places. For some years this firm have made shipments of this type of rolls to the United States Mint at Philadelphia. Frequent additions to equipment have been made, giving the firm exceptional facilities for the manufacture of rolling-mill machinery, steam hammers, squaring shears, shear-grinding machinery, circle-cutting machines, roll lathes, hardened forged steel rolls, roll-turning tools, solid steel shear knives, tool-steel dies of any size and forgings of any kind or size for machinery or tool steel. The shipping facilities are admirable, a recent purchase of ground allowing a switch to be laid from the A. V. R. R. along the side of the forge and into the machine shop, upon which materials are received and delivered.

A Launch at South Chicago.

On the 20th inst the large steel steamship, the "Manitou," was successfully launched at the shipyard of the Chicago Shipbuilding Company, at South Chicago. The "Manitou" is a screw steamer, 295 feet in length, 42 feet beam and 2500 tons burden, built for passenger service, and is one of the largest vessels thus far built for such traffic on the lakes. The owners are the Lake Michigan & Lake Superior Transit Company, operating a line of passenger and freight boats between Chicago and other Lake Michigan ports and points on Lake Superior. This vessel will run to Mackinac Island and Sault Ste. Marie, making two round trips weekly during the excursion season.

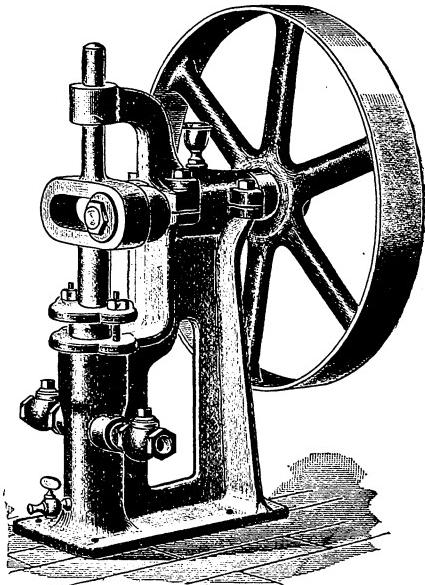
In the construction of the "Manitou" the utmost pains were taken to secure one of the best specimens of naval architecture, and Manager Babcock of the shipbuilding company may well be proud of his work. The rules of the Bureau Veritas of France were followed, under the supervision of Capt. F. D. Harriman, chief inspector of the company for the lakes. The rating will be equal to that of the best ocean vessels. To secure the maximum of safety, a water bottom was built the entire length of the vessel, divided into seven watertight compartments. The motive power is a triple-expansion engine supplied by the Cleveland Shipbuilding Company, who also built the boilers, which are in accordance with United States specifications. Under natural draft the steamship's speed will be 15 to 16 miles per hour, which can be considerably increased by forced draft. The vessel will be handsomely furnished to meet the requirements of the constantly growing passenger traffic on the lakes. There are 120 staterooms extending in a double row round the main saloon, which is over 200 feet in length. A drawing room, 20 x 22 feet, is in the rear of the saloon. Ample space is provided for promenading.

The launch of this vessel was made a gala day by the Chicago Shipbuilding Company and the Lake Michigan & Lake Superior Transit Company. Invitations were extended to a large number of persons and the great business

houses of Chicago were well represented in the party, which was taken on the steamship "Arthur Orr" from the Transit Company's docks by lake and through the Calumet River to the scene of the launch. The arrangements were admirable throughout. The vessel was launched sideways, and immediately righted after striking the water. Very little work will be needed after the launch to fit the "Manitou" for service, everything having been supplied as far as possible while resting on the stays. The return trip to the city was made more enjoyable by a luncheon. The Chicago Shipbuilding Company, although but a young establishment, have already made a considerable addition to the lake steel marine, and their vessels enjoy a high reputation for stanchness and perfect seagoing qualities.

The Lucas Power Feed Pump for Boilers.

The power boiler-feed pump here illustrated is made by C. O. Lucas & Co. of Greenville, Ohio. The plunger is



The Lucas Power Feed Pump for Boilers.

guided at both ends, the power being applied between them. On the wrist pin is a roller working within the link formed on the extension of the plunger, the link being kept in line by means of a collar on each side of it. The pin, roller and collars are made of steel and hardened. This construction insures smooth and easy motion, with minimum friction. The packing box is deep, so as to secure a water-tight packing without great pressure on the gland. These pumps are made in sizes from 1 inch diameter of piston by 2 inches stroke up to 3 inches diameter of piston by 6 inches stroke.

The mineral output of Nova Scotia during the year 1892, according to the annual report of the Commissioner of Mines, was: Gold, 19,998 ounces; iron ore, 75,000 tons; manganese ore, 111 tons; coal, 1,942,780 tons; copper ore, 26 tons. Coke made in that period amounted to 55,000 tons, and gypsum exported to 162,285 tons. The yield of gold shows a falling off of 3393 ounces; but there was a marked increase in the production of iron.

Ferruling the Ends of Boiler Tubes.

From a paper on "Transmission of Heat Through Tube Plates," read recently by A. J. Durston, Engineer in Chief of the British Navy, before the Institution of Naval Architects, we take the following concerning the ferruling of the ends of boiler tubes:

Among the first of the practical suggestions made for ferruling the tube ends was that patented by Humphrys, Tennant & Co., and illustrated by Fig. 2. It will be seen that this ferrule is screwed into the tube at the fire-box end, and that the cap fits into an annular recess cut in the tube plate. The principle of this ferrule is that when a contraction in diameter takes place, due to variations of temperature,

boilers showed that about 70 tubes in all had leaked very slightly. The ferrules had practically not scaled by oxidation. The leaks were so trivial that nothing was done to them before proceeding with the four hours' forced-draft trials, which were successfully made with each boiler singly, 1895 and 2039 indicated horse-power being obtained with the starboard and port boilers respectively, with 2.85 inches and 2.9 inches of air pressure, as against 2250 indicated horse-power, the specified power per boiler. On examination slight unimportant leakage of the tubes was observed, and the ferrules were practically free from oxide scale. Subsequently the eight hours' natural-draft trial was repeated, 3013 indicated horse power being obtained with a mean air pressure of 1.05 inches. On examination a few tubes were found to

the desired result, and it was not proposed to protect the tube plate by any flanging of the ferrule.

The idea of a space formed between the ferrule and the tube at its junction with the fire-box tube plate was recognized as an important point, and a few hours subsequently Mr. Oram, Engineer Inspector, proposed to make the cap ferrule shown in Fig. 3, as one which would provide an effective air space between the ferrule and the tube at and for a short distance beyond its junction with the tube plate, and by its cap also protect the greater portion of the fire box tube plate from direct contact with the products of combustion, and proportionately reduce the formation of steam on the water side of the tube plate. Experience has resulted in the shape of ferrule shown in Fig. 1, but it will be seen that the effective points remain the same.

In order to make a practical test these cap ferrules were fitted in the "Barra-couta's" boilers, which were of the double-ended common combustion chamber type. The port boiler was fitted with wrought-steel ferrules, and the starboard boiler partly with the same and partly with malleable cast-iron ones. On an eight hours' trial of the port boiler at natural draft, 978 indicated horse-power was developed, with a mean air pressure of 1.07 inches, as against 950 indicated horse-power specified, the trial being in all respects satisfactory. It was found that not a single tube had leaked; some of the ferrules were loose and could be turned round by hand, but none of them could be swept out by a brush. The faces of the ferrules, and in a few cases the insides, showed signs of burning and scaling. The loose ferrules were tightened by light rolling with expanders, and on a four hours' trial of the same boiler at forced draft, 1450 indicated horse-power was developed with a mean air pressure of 2.4 inches. Slight priming occurred, which prevented the development of the full power of 1500 indicated horse-power. This trial was also satisfactory, examination showing that no tubes had leaked. The scaling of the ferrules seemed to be no worse, the first formation appearing in a measure to protect the ferrules from further burning.

Next an eight-hours' natural-draft trial was made of both boilers; 1912 indicated horse-power was satisfactorily obtained with a mean air pressure of 0.69 inch, the specified power being 1900 indicated horse-power. All the tubes in the port boiler were tight, but one tube in the starboard boiler showed slight indications of having leaked. The scaling of the ferrules—more especially the wrought steel ones in the port boilers—after this trial was observed to have increased; the first formations had in many cases curled up and broken off, leaving fresh surfaces exposed to the fire, and consequently new scalings had formed. A few ferrules were loose. A forced-draft trial was next made by the starboard boiler. Difficulties arose with the fans, and it was decided to stop the trial after three hours; 1416 indicated horse-power was obtained with a mean air pressure of 2.3 inches. Not a single tube leaked.

Subsequently an eight hours' natural-draft trial with both boilers was repeated, 1932 indicated horse-power being developed with a mean air pressure of 0.77 inch. Examination of the boilers showed that none of the tubes had leaked; a few ferrules were loose, and further breaking off of the scale and

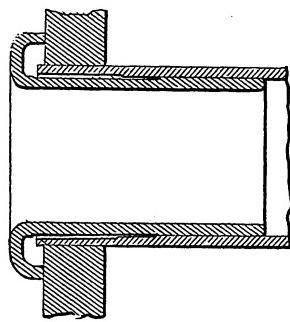


Fig. 1.—Admiralty Cap Ferrule No. 2.

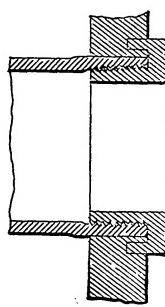


Fig. 2.—Humphrys, Tennant & Co.'s Ferrule.

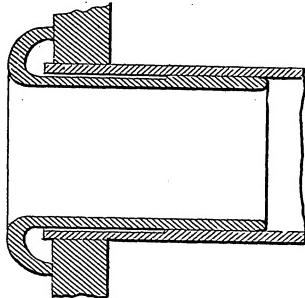


Fig. 3.—Admiralty Cap Ferrule No. 1.

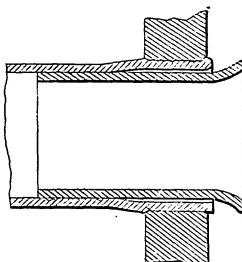


Fig. 4.—Ferrule Suggested by Mr. Peck.

FERRULING THE ENDS OF BOILER TUBES.

the outer part of the ferrule tends to tighten upon the concentric portion of the tube plate. Further, as the ferrule is screwed into the tube, it has the advantage of the holding power afforded by the rolling of the tube into the cooler smoke-box tube plate. It will also be seen that from its construction it provides a large amount of jointing surface and an intricate passage to prevent the escape of water. On the other hand, it has the disadvantage that tubes cannot be withdrawn for cleaning and repairs, but must be cut out, and it is somewhat costly in fitting. Messrs. Humphrys' proposal to fit these ferrules in the two after six-furnace common combustion chamber boilers of the "Medea" for trial was approved. For these trials iron tubes were fitted in the starboard boiler and steel tubes in the port boiler. An eight hours' trial of both boilers was made at natural-draft power, which was satisfactorily obtained with a mean air pressure of 1.26 inches. The examination of the

be leaking slightly under the water pressure, but not sufficiently to necessitate further rolling. No difference was observed in the behavior of the iron and steel tubes.

Shortly after the above ferrule was suggested, Mr. Peck, of Messrs. Yarrow's firm, sent me a letter proposing a ferrule of the shape shown in Fig. 4. The points claimed for this in his own words were as follows: "Something in this direction has, I am aware, been already proposed, but in this proposal you will see that the tube ferrule or protector does not touch the tube where it is fixed to the tube plate, but is in contact with the tube only at a part where all its heat may be readily absorbed. The space between the protector and the tube is rather exaggerated in the sketch, but is only intended to be that due to expanding the ordinary straight tube." It will be seen from this that Mr. Peck considered the space produced by the rolling of the tube in the tube plate would be effective in producing

deeper burning of the ferrules had occurred. It was noticed that the scaling of the malleable cast-iron ferrules appeared to be much less than that of the wrought steel.

At the conclusion of these trials the full water test of 245 pounds was applied to both boilers, and not a single tube leaked. After these satisfactory trials the ferrules were fitted to the six-furnace double-ended common combustion chamber boilers of H. M. S. "Thunderer," which had given great trouble from leaky tubes at all powers down to less than one-third natural draft. On an eight hours' natural draft trial after the cap ferrules were fitted, the indicated horse power obtained was 5900, with an average air pressure of 1.2 inches, the specified power being 5500. Examination showed a few throat seams, rivets and stay nuts to be leaking, but not one tube. Next, a four hours' forced-draft trial was carried out, the results being 7066 indicated horse-power, with an air pressure of 1.96 inches, that specified being 7000. Examination showed only ten tubes leaking slightly out of about 3000.

With a view of testing the durability of the cap ferrules, the "Thunderer" was directed to proceed to Madeira and back at four-fifths her natural-draft power—*i. e.*, 4400 indicated horse-power—and sailed for that purpose on the morning of July 16, at 6 a.m., arriving at Funchal at 1.30 p.m. on the 20th. Leaving again at 9.30 a.m. on the 23d, the power on entering the bay was increased to 4780 indicated horse-power, and maintained till Portsmouth was reached at 3.45 p.m. on the 27th. The average speed out and home was 12.8 knots. Examination of the boilers showed one ferrule to be missing, and its corresponding tube leaking; also one adjacent tube showed signs of having leaked slightly. Several ferrules had become loose, but could not be removed by hand. The ferrules were thickly furred in the manner frequently observed in torpedo-boat locomotive boilers, and about 30 out of 3000 were worn out.

During the past week the "Vulcan," after having the vertical rows of tubes—those which had been removed to improve the circulation—replaced and the tubes cap ferruled, has gone through a satisfactory four hours' forced-draft trial, the indicated horse power being 12,032, as compared with 12,000 indicated horse-power specified, the mean air pressure being 1.8 inches. These cap ferrules have been fitted to several other ships having various types of boilers with satisfactory results, and requests for them are being made by ships of the fleet, with the view of protecting the tube plates and ends from overheating produced by accumulation of grease or scale in the boilers, and they will be probably fitted to most vessels. In respect of protecting the tube plates and ends from overheating, whether by want of circulation, excessive temperature in the combustion chamber, or from the presence of grease or solid matter, it is submitted that these cap ferrules have fully answered their intended purpose.

The immigration into the United States during April increased, although it is not as large as last year. The total at the principal ports amounted to 75,261, against 90,595 for the same month in 1892. The total arrivals since January 1 were 145,299, against 188,599 for the corresponding four months of the previous year.

WORLD'S FAIR NOTES.

The Sunday Question.

The fight over the question of opening the gates on Sunday has been the absorbing topic of discussion the past week. At one time the Sunday openers seemed to be in the ascendancy, as the local directory had named the 21st inst. as the day on which the gates would be thrown open, although the buildings were to be kept closed. The National Commission, however, failed to ratify this rule in time, and on Friday the following resolutions were passed by the directory:

Whereas, On May 12, 1893, this board adopted a rule to open the gates to the grounds of Jackson Park on Sundays at an admission charge of 25 cents; and

Whereas, On Tuesday May 16, this board adopted, as empowered under Sec. 7 of the act of Congress, a general rule to open the entire exhibition on Sundays at the admission price of 50 cents; and

Whereas, This rule last named has been duly certified to the World's Columbian Commission for such modification, if any, as that body may desire to make under the law; and

Whereas, Said commission has not yet reached definite action; now, therefore, be it

Resolved, That in order to avoid action that may anywhere be characterized as precipitate, the operation of the rule above referred to be suspended for one week, and that on Sunday, May 21, the gates be closed.

The great struggle over this important matter takes place this week. In the National Commission the sentiment is believed to be strongly in favor of Sunday closing. Their decision against opening will be resisted by the local directory and then a legal fight will follow. The matter is already in a sense in the courts, as a stockholder has applied for an injunction to restrain the managers from closing the exposition on Sunday. Very great interest is shown in this matter all over the country, and it is by no means a local question.

A Whaleback Passenger Boat.

Capt. Alexander McDougall's scheme, which was thought chimerical when announced, has been realized, and a great passenger whaleback now runs on Lake Michigan between the business center of Chicago and the World's Fair docks. It is named the "Christopher Columbus." It arrived at Chicago on the 18th inst., making a speedy trip from West Superior, where it was launched. The "Christopher Columbus" is the first passenger whaleback ever built. Besides this, it is the longest vessel seen in the port of Chicago. It was built for lake service in a lake shipyard, and is the perfection of a new idea in shipbuilding. A few years ago Captain McDougall evolved his whaleback idea and freight steamers were successfully launched. The new vessel looks almost as queer to modern eyes as the old high-decked vessels of Columbus' time. Three decks rise above the whaleback and tower in the air like the circles in an amphitheater. The vessel was begun September 6, 1892, and completed and launched December 3, 1892. The monster steel cylinder is 362 feet long, with a beam of 42 feet and a depth of 24 feet. Triple-expansion engines with three cylinders, 20, 24 and 70 inches in diameter, lie in the torpedo-like steel shell. With 2600 horse-power the whaleback rides the waves at the rate of 20 miles an hour.

During the voyage to Chicago the vessel went at the rate of 18 miles an hour.

Heavy seas were met on the trip. The whaleback did not cut through them, but rode over them. The bottom of the cylinder has nine water-tight compartments for a water ballast of 730 tons, which serves to keep the vessel in an upright position. Seven turrets support the decks. There are five decks altogether, including the main, the promenade, the turret and the hurricane. In the cylinder is another deck, where the restaurant and dining room are to be managed.

Along the promenade deck runs the grand saloon, 225 feet long by 60 feet wide, with a ladies' cabin aft. The saloon will likely make passengers forget that they are riding on the lake. The apartments are handsome and luxurious throughout. No one could wish for a prettier room. Cushions soft and easy cover the chairs, the decorations are artistic, and the view from the windows superb. In the center of the saloon rises a fountain which trickles down a crystal globe into an aquarium below. On the windows designs of ships, from Noah's ark to the whale back, are engraved. The captain's cabin, the wheelhouse and the officers' quarters are on the promenade deck. Everything is painted white down to the water line.

The arrangement of the decks above the cylinder is unique and gives the seasick passenger a sense of comfort and safety which is absent on other big passenger boats. One can stay far out of reach of the waves and breathe the fresh air freely. Passengers are not huddled together below deck in a stuffy atmosphere and within sound of the waves as they dash against the sides of the vessel. The waves of Lake Michigan will have free access to the deck of the cylinder, but they will hardly climb higher.

New and Old Tracks.

An important attraction was added to the exposition last week by the opening of the exhibit of the Pennsylvania Railroad Company, which is an independent feature located between the Hygeia Building and Cold Storage. A number of prominent railroad officials were present and an abundance of handsome bunting was unfurled, but there were no formal ceremonies.

The space assigned the Pennsylvania Company is 400 x 150 feet, and the exhibit is partly outdoors and partly housed in the main hall, 100 x 40 feet in size, of a model railroad station, 140 x 40 feet in size, built of staff and of classical and beautiful architecture. The exhibits relate only to the transportation lines comprising the Pennsylvania Railroad system, and its design is not only to perpetuate the early history of the lines merged into or associated in interest with the Pennsylvania Company, but also to place permanently on record the results that have attended the efforts of the management's advanced methods.

One of the outdoor exhibits is a section of a four-track standard railroad, 100 feet in length, laid with standard 100-pound rails, or 3333 pounds to the rail, with frogs, switches, stone ballast, ditches, signals, and overhead foot bridge. The rails are 100 feet in length. The track is ballasted with crushed stone and drained on each side by drains made of concrete. The signal tower is equipped with a special Westinghouse electro-pneumatic machine, which controls the two switches and six signals governing the track.

On this splendid track and in strange contrast with it, is exhibited the old

locomotive "John Bull," with pilot and tender complete, which was first put in service on the Camden & Amboy railroad November 12, 1831, and which is the oldest complete locomotive in America. It was still able to haul to the exposition the two Camden & Amboy passenger coaches of the style of 1831, leaving New York April 17 and arriving in Chicago April 22. On the track are exhibited also the two special gun cars on which the two huge Krupp guns of 10 inch and 16½ inch bore were transported. The guns weighed 140,000 and 285,000 pounds respectively and the gun cars 113,300 and 175,000 pounds, making totals of 253,300 and 460,000 pounds. Reproductions of the guns are mounted on the gun cars.

Still more interesting, if possible, is a collection of old railroad material sent in a special car from the Smithsonian Institute in charge of J. Eifreth Watkins. It consists of a number of specimens of articles in use as far back as 1830 or 1831. Old signals, wooden engine and car wheels, strap rails, and primitive switches and crossings are exhibited, but the most interesting article is a section of track laid in 1831 on the Camden & Amboy Railroad. The rails are about the size of those used in mines for small hand cars. The ties are blocks of granite about 2 feet wide, laid three to each rail. The stone sleepers are provided each with two holes, or, when they come at the joint of two rails, with four holes. In these holes were driven locust wood plugs and the rails were fastened down by spikes driven into the locust plugs. When they fastened a rail in that way in 1831 it was expected to stay. The rails themselves were held together by single fish plates at each joint, to which they were riveted with hot rivets. This was to make the track very rigid, the possibility of rails wearing out never occurring to railroad men in 1831, since at that time none had ever given out.

These valuable relics of some of the first railroad work done in this country will be returned to the Smithsonian Institute at the close of the exposition.

The indoor exhibit consists of: 1, panels, relief maps and charts; 2, models; 3, canal boats and appliances; 4, special machinery; 5, monuments; 6, safety appliances, precautions and uniforms; 7, floating equipment; 8, switches and frogs; 9, tracks and signals; 10, bridges; 11, relics, numbered from 36 to 762, in cases; 12, relics, numbered from 373 to 463, in frames; and 13, views on the Pennsylvania lines, numbered from 2529 to 2590.

ANOTHER DISAGREEMENT OVER AWARDS.

The agricultural machinery exhibitors at the exposition wrestled with the question of awards at the Grand Pacific last Friday night. H. C. Staver of Chicago, president of the Chicago Vehicle and Implement Club, presided. John Boyd Thacher, chairman of the Executive Committee on Awards, explained the methods of judging. There would be no graded prizes. Every meritorious exhibit would receive a medal and accompanying diploma. There was no fund for field trials of agricultural implements. The judging would have to be done on the floor.

Mr. Manning of Syracuse, N. Y., said that the plow exhibits were not ready for field trials, and judging on the floor was an absurdity.

Colonel Dodge of Dixon, Ill., as a representative of the Western Plow Association, protested against any awards whatever, declaring that no man could

be secured competent to pass upon plows.

Mr. Robie of Indiana declared there was not a man on earth competent to pass on engines and thrashing machines on the floor.

After Mr. Cox of Illinois suggested that exhibitors could withdraw from the judging, a discussion was had as to the advisability of all withdrawing. A vote showed 20 for withdrawal, 15 against, and 25 not voting.

Chief Buchanan of the agricultural department suggested that the various lines represented get together and agree upon what plan they should pursue. Unless all stood out of the judging he would be compelled to report to the judges those who desired to stand for the awards.

Hon. James Martin, M. P., and special commissioner from New South Wales on machinery and agricultural implements, then addressed the meeting by invitation, and complimented the American agricultural implement exhibit as a revelation.

A committee consisting of Messrs. Manning, Cox, Farie, Bevington and Francis was appointed to report at another meeting, to be held at the Grand Pacific next Friday night, a form of permanent organization for the agricultural implement exhibitors.

THE PHOTOGRAPHIC CONCESSION.

The representatives of trade papers and other illustrated periodicals have been seriously inconvenienced by the restrictions placed on them in securing photographs of exhibits. They have been obliged to apply to Official Photographer Arnold for all work in this line. A slight loophole was offered in the way of making special photographs by a rule permitting small hand cameras to be carried on the grounds at a tax of \$2 each per day, to be paid to the official photographer. Complaints of high charges and slow service rolled into headquarters, until finally the National Commission made the matter the subject of official inquiry. The Special Committee appointed last week to inquire into the concession of Mr. Arnold, the official photographer, made its report on Friday. Members of the committee said that no records of the concession had been found in the Director-General's office, and it was a puzzle to them when Arnold and his partner got the authority to levy a tax on persons carrying cameras in the grounds. The following resolutions were adopted:

That all publishers of illustrated papers or periodicals shall be permitted to send their photographers or artists upon the exposition grounds and in the exposition buildings to take pictures for publication in their respective papers or periodicals under the rules already adopted, provided that said pictures shall be used for no other purposes.

That when publishers elect to employ Mr. Arnold, the official photographer, to make negatives for them they shall be made at a reasonable price without unnecessary delay, and that said negatives shall be the property of said publishers after they have paid for them and shall be in their possession, provided, however, that neither of the said negatives nor any print therefrom shall be used for any purpose other than for publication in the periodical or paper for which it is made.

That the Director-General is hereby directed to enforce the rule adopted by the commission and found upon page 138 of the official minutes of the seventh session of the said commission, which is as follows: "Sketches, drawings, photographs and other reproductions of articles exhibited will be allowed only upon the joint assent of the exhibitor and the Director-General. But photographs may be taken upon the grounds and general views of portions of the interiors of the buildings may be made by the approval of the Director-General."

The committee was not discharged, but instructed to learn all possible about the photographic concession and report at its earliest convenience. There is now some hope that the fine exhibits at the fair can be adequately shown in periodicals. The difficulty of securing prompt service and the high cost of the official photographs were serious impediments in the way of securing desired illustrations.

INCREASING ATTENDANCE.

Fine weather last week served a two-fold purpose. It greatly increased the attendance and decidedly hastened the work of getting the grounds and buildings in better order. Although there are plenty of exhibits in every department which are not yet in proper shape and may not be for two or three weeks, the exposition is now well worth visiting. It will be necessary for visitors to bear in mind that some of the States have exhibits of a most interesting character in their own special buildings. Many things are likely to be overlooked on this account, merely because they are not in the principal exposition buildings. The rate of admission for children was fixed the past week at 25 cents for those 6 to 12 years old, while those under 6 are admitted free.

THE WHEELING NATURAL GAS COMPANY.

The annual report of the Wheeling Natural Gas Company for the year ending March 31, 1893, makes the following exhibit of assets and liabilities after the books closed:

The quick assets and total liabilities on March 31, 1893, were as follows: Assets - Developed but unoperated oil leases, \$102,440; accounts receivable, \$8295.24; cash, \$816.65; gas sales in March, 1893, \$9423.37; unsold oil, 8186.95 barrels, \$5485.26; Venture Oil Company, \$95,471.66; total, \$231,932.18. Liabilities: Bills payable, \$112,836.26; accounts payable, \$6,935.68; rentals, \$1410; gas and oil expense account, \$3000; total, \$124,181.64. Surplus, \$97,750.24.

The gross earnings were \$230,165.73; expenses, \$57,550.72; net earnings, \$172,615.01. In his annual report the president says:

"The \$60,000 of the authorized capital stock still remains unsold and unissued. The financial statement for March 31, 1893, shows the total assets to be \$1,177,637.13, after charging to profit and loss the sum of \$192,892.24, being all expense accounts and depreciation in gas wells, tools, fixtures, leases, &c. The oil leases of the company, more fully developed since last annual report, cash on hand, accounts receivable and other items aggregate \$221,932.18, showing a surplus March 31, 1893, of \$97,750.24, after deducting \$124,181.94, the total liabilities and running expenses for March, 1893; the sum of \$124,800.87 in excess of capital and debt having been paid out of earnings. The earnings for the year from sale of gas and oil amounted to \$230,165.73, the running expenses, &c., \$57,550.72, equal to 25 per cent. of the earnings. The increase in operating expenses over those of last year is owing to the oil operations extending our field work, and is partly owing to the expense of over \$7000 we were at last summer in going over our entire main gas line. The plant now embraces 198.08 miles of pipe, 26 producing gas wells, 26 producing oil wells and one gas pumping plant."

An Important Consideration in the Design of Boilers with Curved Back Heads.

Since the general adoption of the higher steam pressures which rendered boilers of the cylindrical type a necessity, their common form of construction has been that in which the shell proper is as near a perfect cylinder as it is possible to make it, while the ends or heads are flat. These heads being bound circumferentially by the shell are not subject to any tensile strain, and can be made far thinner than the shell sheets, to great advantage, their tendency to bulge outward by reason of internal pressure being resisted by suitable bracing extending from one end of the boiler to the other. When boilers are made of great diameter, such as those for the largest class of ocean steamers, the longitudinal braces become quite a matter of moment in the general weight of the structure, and as it is necessary that they be placed comparatively close together (seldom more than 15 inches from center to center), they hinder more or less that free access to the interior that is most desirable for examination, cleaning and repair. Hence many modifications have been attempted with a view of decreasing the number of such braces without in any way affecting the efficiency of the apparatus.

The ideal form of spherical ends presenting far too many practical difficulties in construction and furnace fitting to meet with favor, a type was evolved in which the top end sheets were curved back to a radius of a length nearly equal to the distance from the top tubes to the top of the shell, thus forming portions of cylinders at right angles to that of the shell, the idea being that for these portions of the heads no bracing whatever would be required. At first glance the design appears to have very many points of excellence, but, as a matter of fact, not a few of this style have already been built, without allowance having been made for the entirely new strain which is here brought on the tube sheets by the removal of portions of the ends of the circumscribing shell, and if the large factors of safety were not used there would undoubtedly be rupture of the parts to mark the defect.

To better illustrate this point, Figs. 1, 2 and 3 are given, the first showing, in section, the general construction of a large boiler of the curved back type, the second an elevation of part of the boiler, and the third presenting a partial transverse section through the middle of the curved head (A B, Fig. 1) wherein the interrupted circle is made apparent.

From Fig. 1 it can be readily seen that had the cylindrical shell been carried out on top (as in the ordinary form, like at the bottom, all radial stress in the cylinder would have been uniformly resisted by the tensile strength of the shell sheets, and the heads would not be in tension, but simply subjected to the pressure resisted by the braces and by the binding shell, which also act as braces at the periphery, but it is equally obvious that the moment the top part of the cylinder is cut away and the new curved surface substituted, this latter part becomes a portion of a new shell and the heads (or the middle of them) are similar to the shell of a boiler with oval top and flat sides. So that the pressure which tends to disrupt this oval top is transmitted also as a tensile strain to the heads or tube sheets, tending to tear them apart in lines hori-

tally across the face, and no amount of longitudinal bracing assists in resisting this new strain. The flat parts, of course, must still have braces, but it becomes imperative to also strengthen them against the vertical stress, and to either greatly thicken the sheets themselves or to rivet heavy T or L irons to them, at or near the middle line. The latter plan is being adopted as the best

corners will drop below their original line, neutral points being between the middle and corners. This was practically proved recently in testing a boiler of this kind designed for Government use. A long arm was suitably rested on the corner and when under test pressure a marked drop occurred at this point. Therefore we conclude that if middle vertical line of the tube sheets

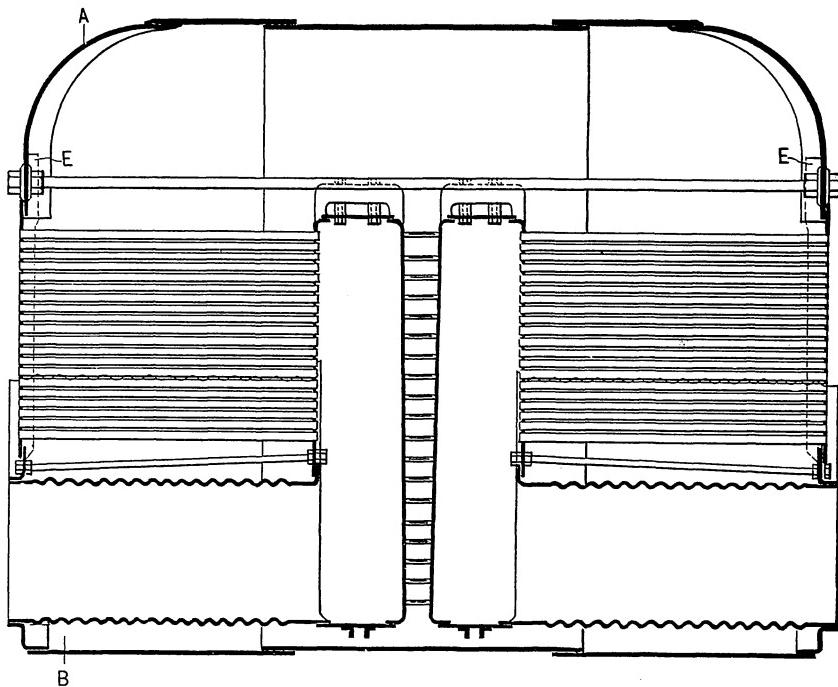


Fig. 1.—Curved Back Boiler.

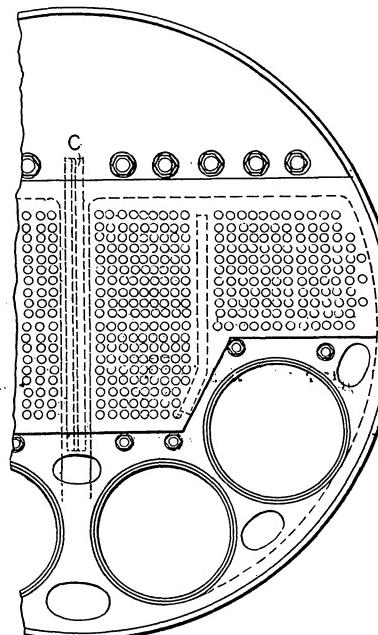


Fig. 2.

be sufficiently strengthened the remainder may retain very nearly its old degree of thinness, and continue serviceable as efficient heating surface.

In a boiler of the size given, but with end of usual form, there would have been required two additional rows of braces, say 14' more braces $2\frac{1}{2}$ inches in diameter by 20 feet long, weighing in the neighborhood of 4700 pounds. Against this saving of weight we must place an increased weight of head, and against the feature of accessibility we must put the increase in first cut and difficulties in fitting manhole plates, pipe nozzles, &c., to the curved front. But, generally speaking, this form is particularly well adapted to large boilers on steamers, as the two ends may be readily connected by uptakes curving over the top to a central stack, and thus in easy lines leading the gases where their casing will be an additional lagging or preventer of radiation to a good part of the shell.

In applying the T iron, it is essential that its upper end extends up on to the curved top, the latter being always made of same thickness as the shell sheets.

Some idea of the cost of running the cruiser "Baltimore," ordered to China, may be obtained from the report of her cruise last year, which amounted to \$307,700, including \$48,000 for coal.

Cogged vs. Hammered Steel.

The respective merits of the hammering and cogging processes have frequently been the subject of lengthy and animated discussions at the meetings of the Iron and Steel Institute and kindred societies. The recently published report of Stewart & Clydesdale, Limited, has again raised the question in an acute form, and at the shareholders' meeting the whole subject was considered, reports being submitted from two of the most successful steel makers in Scotland. One of these reports described the question of hammering or cogging as being quite an open one; the other, emanating from a firm holding an unequalled record for the production of special boiler plates, decidedly favored hammering in preference to cogging for the highest qualities of mild steel plates. Since the meeting a well-informed correspondent, probably himself a steel maker, has in the columns of the Glasgow *Herald* endeavored to discount the pronouncement of the eminent firm alluded to by strongly advocating the claims of the cogging process. His first and main objection to hammered steel will, however, strike most practical readers, and especially engineers in want of trustworthy material of great tensile strength, as rather wide of the mark. He says, in effect, that a piece of steel hammered out till it is practically forged would stand a most satisfactory bending and elongation test, but would exceed the maximum tensile strength permitted by Lloyd's, the Admiralty, or the Board of Trade, and would therefore be summarily rejected. This may be perfectly true, but these surveying bodies have no objection to high tensile strength *per se*, the present limits having been wisely fixed on account of the brittleness and general unworthiness which experience has shown to be too often characteristic of steel having a high tensile strength. Other things being equal, the metal with the highest degree of tenacity would undoubtedly be preferred for all structural purposes. Hammering without doubt increases the tenacity of soft steel, but the final tenacity imparted to any given piece of steel by working it under a hammer depends upon its initial hardness or strength, and on the amount of work put upon it. The judicious manufacturer accordingly apportions the amount of hammering his ingots receive to suit their initial strength and the quality and thickness of the plates he intends to roll from the hammered slabs. To the uninitiated this may seem a difficult matter, but in a well-ordered open-hearth steel works the ingots from any given cast are hardly transferred to the soaking furnace before every person concerned knows—as the result of rapid but definite tests made on samples subjected to a standard amount of manipulation—not only for what quality of product that particular charge is suitable, but also, within certain limits, the thickness of the plates or bars to be rolled therefrom.

Rolling increases the tenacity and hardness of steel as well as hammering, though not to the same extent, and a piece of steel which might be near, but still within, the upper limit of tensile strength as a 1-inch plate would, in all probability, if rolled down to one-fourth of that thickness, rise considerably above it, and so be liable to rejection. Greater liability to deterioration of product by imbedded scale, and danger to the lever men and others engaged in "slabbing," are also alluded to as objectionable features of the hammering

process. The latter objection at any rate will be generally admitted, but the final statement describing hammering as a superficial operation affecting principally the outside of the steel is certainly incorrect and quite at variance with the assertion made at the outset that plates rolled from hammered slabs have a higher degree of tenacity than those which have been cogged. The cogging mill is without doubt rapidly supplanting the slabbing hammer in most steel works, not, we are inclined to think, on account of the superiority of the product obtained, but because it lends itself to cheaper production and a larger output. Another point in favor of the mill, which in these days of constant labor troubles carries considerable weight with manufacturers, is the fact that it is much easier to train new men to man a cogging mill than a slabbing hammer, while at the same time less labor is required per ton of finished steel. That cogged steel has any real superiority over hammered steel—except, perhaps, in the matter of greater exemption from "pitting," due to imbedded scale—has never been proved. Facts rather point to the opposite conclusion. But the experience of a considerable number of years has abundantly shown that mild steel plates, capable of fully satisfying the most exacting requirements of the different surveying bodies, can be regularly produced by the cogging process, and, for the reasons already stated, it seems likely to be universally adopted for the manufacture of ordinary structural steel in all works which have a large enough output to keep a mill going. The hammering operation will still retain a field of its own in the production of special qualities of steel requiring great tenacity, combined with toughness and freedom from hardening qualities when suddenly cooled; in other words, steel of high tensile strength with a low carbon content.—*The Engineer.*

San Francisco News.

The history of the hardware and iron trade in this year of grace is that of every other line of business, and it is not at all a record of unmixed satisfaction. Truth obliges us to tell that business in all these lines has been almost without an exception very dull and unsatisfactory. The history of nearly all lines of trade for the past year or so has been one of light sales, small profits and a decrease in the number of clerks and salesmen employed. It is claimed that there was in the State of California at a very recent period upward of 18,000,000 bushels of wheat unsold and mostly in farmers' hands. Now, while this may be deemed an exaggeration, it is certain that there is a very large stock of wheat on hand. This of course has kept back trade, as supplies have been only laid in sparingly. It is certain, however, that this wheat must be let loose on the market, whence will arise the distribution of a great deal of money among all classes in the State, a moderate degree of prosperity and a decided improvement in trade. We expect, therefore, that there will be a very good demand for hardware for the next three months. The same is true of the trade in bar iron and steel.

The imports of hardware, &c., by rail since the first of the year have been sensibly lighter than those for the same time last year, while those by sea have considerably increased.

The imports of foreign articles in iron and steel, and their manufactures, for the first quarter of 1893 have been as follows:

Pig iron.....	1,362 tons	-\$15,698
Bar iron	523,569 pounds	9,096
Steel ingots	3,306,586 pounds	32,225
Sheet, plate, &c.	1,104,758 pounds	16,993
Tin plate	5,887,989 pounds	78,943
Wire and wire rope.....	2,240 pounds	28
Wire rods.....	386,286 pounds	7,009
Anvils.....	17,463 pounds	990
Chains.....	4,202 pounds	188
Pig tin.....	773,165 pounds	132,550
Machinery.....		20,220
Cutlery.....		988
Anvils.....		1,565
Firearms.....		41
Iron and steel, all other manufact- ures.....		6,236
Total.....		\$813,940

Imports, except in the case of tin plate and ingot steel, have been less for the first quarter of the year than for the same time in 1892. That of pig iron has been very light. The stock of pig iron at the close of the year was equal to the consumption of more than half a year if gauged by the figures for 1892. The market for pig iron still continues dull and low, especially for American, which is quotable at \$19 @ \$20. There will probably soon come a turn in the dullness which has prevailed in our commercial and manufacturing circles, and I think that the present year will witness it. The freight problem, which was the great one that San Francisco merchants had to solve, is working itself out. Freights are now about as low as they can be expected to be, and we have not only the Cape Horn route but also the Panama as competing factors. The Pacific mail, having been shut off from the Panama route, is looking up one, either by a railroad line across Costa Rica or Guatemala, as also by one via Tehuantepec. It takes some little time to recover from the dullness consequent on the results of a system which has paralyzed the energies of the community for years.

W. K. Vanderbilt's new yacht "Valiant," which is to replace the sunken "Alva," was launched at Birkenhead, near Liverpool, last week. She has been built by Laird Brothers, and is a steel twin-screw vessel of 2400 tons. The principal dimensions are: Length between perpendiculars, 310 feet; beam, 39 feet; depth, 25 feet 6 inches. She will have two sets of triple-expansion engines driving manganese bronze screws. The horse-power to be developed will be 4500, which will insure with moderate forced draft a speed of 17 knots, while under natural draft the vessel will steam 15 knots. The "Valiant" will be fitted with all modern improvements, including the electric light and two powerful search lights. The hull is of steel, subdivided by water-tight bulkheads, and fitted with a cellular bottom arranged to carry water ballast.

Prof. George Forbes of the Niagara Falls Tunnel & Power Company says that the machinery which is to supply Buffalo with power from that source will be turning by the latter part of the summer or the early fall, so that many World's Fair tourists will have the opportunity of seeing it in operation. The initial tunnel will divert about 100,000 horse-power. This will certainly be increased to 450,000 horse-power, but it is improbable that the whole of this amount will be utilized for some time to come.

THE WEEK.

It is proposed to cover the spacious dome of the capitol building in Colorado, now approaching completion, with a heavy plating of silver.

A news dispatch from San Francisco announces the formation there of the International Construction Company, whose purpose it is to aid in the building of the Nicaragua Canal. Some of the incorporators are: Irving W. Scott, president of the Union Iron Works of San Francisco; John W. Mackay, Louis Gerstle, one of the large owners in the Alaska Commercial Company; William M. Merry, president of the new steamship line running in opposition to the Pacific Mail between New York and San Francisco, and Alexander C. Hamilton, manufacturer of agricultural implements on the Pacific Coast, and the company are said to have a capital of \$10,000,000. They propose to obtain from the parent Nicaragua Company a contract for building the section of the canal from Lake Nicaragua to Butu, the Pacific Coast end.

The leakage of crude petroleum in steamships is liable to find its way into the engine room bilges and cause a dangerous explosion, such as occurred in Liverpool recently.

Terminal warehouses are to be erected in Baltimore similar to those in Philadelphia to relieve crowded freight depots and to facilitate the shipment of goods. Fast-running elevators will be a feature.

The *Market Record* of Minneapolis indicates that the spring wheat crop may equal that of last year, and that the total crop may be expected to reach 440,000,000 bushels, with 135,000,000 bushels available for export. But at this date there are very scanty data for estimating the spring wheat crop.

Last year 55 iron and steel vessels, of 51,374 tons, were built in this country, of which 27 were built at Atlantic and 23 at lake ports. The latter are fast forging ahead.

The aggregate losses sustained by holders of industrial stocks are estimated to have been \$105,830,000, caused by shrinkage since January 1. But this is not all. The disturbance resulting affected other stocks to an extent almost treble this enormous amount. Fortunately the valuations were to a large extent imaginary.

It is intimated from Washington that the Postmaster-General may take measures to hasten the delivery of the European mails by making further improvement in the ocean post offices.

The late genial Rufus Hatch, known to the *habitues* of Wall street, says in his will that he much prefers that his sons should "learn a mechanical trade, so that they will always be sure of an honest livelihood."

Secretary Herbert is hastening work on the new ships.

California orange growers are suffering from a glutted market and low prices.

A commercial writer, commenting upon the recent collapse of the industrials and the disfavor with which investors regard monopolies, says: "It is now better appreciated than at the time of their conception that these concerns were chiefly organized for speculative ends, and that the much-vaunted econo-

mies of combination were usually used as mere pretexts to aid in the marketing of enormous quantities of watered stocks."

Forced sales of merchandise caused by monetary stringency have tended to lower prices, but the general markets are now supposed to be recovering their normal condition.

Justice Daly of this city decides that old buildings cannot be converted into hotels unless they are fire proof.

A decree ordering a report of all accidents happening to persons employed in industrial establishments, mines, &c., has been signed by the President of the French Republic. The report is to be transmitted to the mayor of the district within 48 hours of the occurrence of the accident. The employer is held responsible for the transmission of such report, which is to be accompanied by a medical report of the condition of the sufferers and a declaration signed by the witnesses of the accident.

New Orleans was ahead of all other ports in corn shipments during April.

Australian drafts are refused by bankers in San Francisco.

American exporters in South Africa will have no lack of cheap transportation for some time to come. The pioneer steamer of the American and African line which sails from New York to-day will be opposed by another English line, to sail June 15, which announces its intention to cut rates. The former announce that shippers by their line shall not be placed at any disadvantage. In shipping circles a belief is entertained that the two lines cannot do business at a profit.

The State of Kansas has just opened an employment bureau, "and will seek to supply employers with help at five cents for each situation, or, rather, for placing employer and employee in communication with each other."

The great Cunard steamer "Camarina," which has just broken the ocean record, is expected to make better speed when her propellers have been adjusted and the propeller blades given a different pitch.

Monopolies are again the object of attack. Governor Flower of this State has signed a bill which makes the formation of combinations and trusts a misdemeanor, and in Illinois an action has been commenced by the State Attorney-General to compel the Whisky Trust to show by what authority it exercises such control over the output of distilling products and over dealers as to destroy competition in their manufacture and sale. Later comes the anti-coal combine convention in Minnesota.

Work on the Public Buildings in Philadelphia has been suspended for some little time owing to the effort which has been made to abolish the Building Commission, under whose charge the work of erection has hitherto been carried on, and to place it under the direction of the Director of Public Works. A decision in the matter is expected shortly, when operations will be resumed. The completion of the structure will, however, take some time longer. All the massive columns and pilasters of the tower, together with some of the smaller iron work for the clock story of the Public Buildings, have been successfully passed through the electro-aluminum plating process at the Tacony Iron & Metal Company's works.

The Brady's Bend Iron Company.

The master's report in the Brady's Bend Iron Company's case was substantially confirmed by Judge S. S. Mehard of Mercer, Pa., in an opinion handed down at Kittanning, Pa., on Monday, 15th inst. It was decreed that the property be sold and proceeds distributed to labor claimants and second mortgage bondholders. The interests of Galusha A. Grow and Hunter & Cummings are exempted from sale. They consist of mineral leases.

The Brady's Bend Iron Company were incorporated in 1861 and an extensive iron mill was erected. A prosperous business was carried on for several years, and a town of 5000 people was built. Five years later the company were compelled to mortgage all their property. Prior to this bonds amounting to \$500,000 had been issued, and to secure them a second mortgage was executed in 1867. In 1874, at suit of the second mortgagees, the property was sold subject to the first mortgage.

In 1890 a bill in equity was filed to foreclose the first mortgage. The matter was referred to John F. Whitworth, Esq. He found in favor of the defendants. Exceptions were at once taken by the plaintiffs. These exceptions were argued before Judge Mehard and in passing upon them he passed upon the entire report, with the above decision.

Superintendent Hannan of the New York State Department of Public Works has issued an order that all persons desirous of experimenting with electricity and other power for propelling boats on the Erie Canal must have their applications for the privilege to do so experiment on file by June 5. This order is issued in pursuance of a law passed by the last Legislature authorizing the superintendent to designate certain sections of the Erie Canal on which experiments may be made for testing the efficiency of such devices as may be offered for improving by electrical or other means the present system of canal towage, such experiments to be conducted at the expense of the parties making them.

According to a London journal, the results of the official surveys recently made by order of the Government of Japan show that the coal fields in the island of Yezo are likely to prove of great commercial and industrial importance to that country. The workable coal beds are estimated to contain at least 150,000,000,000 tons, or about two-thirds as much as those of Great Britain. The coal hitherto obtained is of somewhat uneven quality, but is declared by the British consul to be "all marketable."

The Bethlehem Iron Company have just finished the repairing of the broken shaft of the American Line steamer "Paris." When she was the English steamship "City of Paris" the work of building and repairing was done on foreign shores. Under the contract with the American Line the shaft had to be completed within a specified time.

The White Star Line has given an order to Harland & Wolff, the ship-builders, for the construction of a steamer 800 feet long, which is being built on a new principle as to the engines and steering gear, and is expected to equal the speed of anything afloat.

The Iron Age

New York, Thursday, May 25, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

A Better Era for Labor.

London papers express a feeling of relief now that the 1st of May, chosen by the labor classes as the time for a general public protest against the ascendancy of capital, has passed away without a disturbance anywhere, either in the United Kingdom or on the Continent. The fact observed seems to have created great surprise, both on the part of government authorities and the Socialist element, which from the outset has been foremost in expressions of discontent and in lawless violence. In every capital, we are told, the troops were confined to barracks, the cavalry patrols were strengthened, and the police received orders which the populace entirely understood. With the apparent tendency of public sentiment since days long before the terrific scenes of the Paris Commune, a steady increase of disorder and violence might have been expected, always ready to take advantage of fitting opportunities; and the military authorities at all central points seem to have taken this view, as they were on the alert, prepared to grapple with the first threatening outbreak. The change that has taken place in the attitude of the working classes is supposed to be due in part to the hopelessness of success where a disorganized rabble is opposed by a disciplined force. Beyond the effects of intimidation, a more potent influence in controlling the laboring classes is the much greater confidence in a resort to legal measures in seeking redress. The London *Economist* says:

"The people everywhere see what is occurring in France and England and Germany, and think that their voting power may ultimately give them all that they require. It does give it in France. In Germany the Socialist vote grows always heavier, and in Austro-Hungary the ministers are perpetually offering sops to the Labor party. The leaders understand how the vote may be used if their followers do not, and in Belgium, where passions are very fierce, they, after calling out the masses, upon the concession of the franchise sent them back instantly to their work again. This is an immense improvement, if only because it postpones physical contests; and it does a great deal more than this. The power of voting at the same time brings new leaders to the front, who are competent to win results by other means than descent into the streets."

Moreover, the Socialists in Europe as well as in the United States find that the working classes as a whole, and

especially the educated mechanics and skilled artisans, are not in sympathy with the anarchistic principles they avow, and which constitute no effective bond of allegiance. Therefore it becomes the part of prudence, if it is not indeed the dictate alike of reason and policy, for the would-be reformers to content themselves with words. In this latter respect, too, there has been a notable change, so that the "freedom of speech," so long the boast of Americans, is enjoyed in Europe to an extent that was unknown until within a recent period. Expressions are now indulged and tolerated which a few years ago would have excited alarm for the public safety. The fact remains to be considered that in a degree—but hardly in an advance of wages—the position of the artisan has actually changed for the better. "There is a disposition among masters to listen to complaints, and where they can be remedied without reducing profits to remedy them. The hours of labor, though in many trades irrationally long, have been shortened perceptibly, and on questions like sickness, pensions, and insurance against accident, there is a disposition to be lenient, which the governments sedulously foster." The employers are willing to concede that in a case of dispute it is possible that they may be partially wrong. In the general survey of the labor situation in Europe, the recurrence of the once much dreaded 1st of May gives occasion for congratulation, on the part of both employers and workmen, that there are some indications of mutual conciliation and approachment rather than of animosity and distrust. It may be hoped that the deplorable events witnessed not long ago in Belgium, Pittsburgh, and other great manufacturing centers were the culmination of troubles long pending and that better things are to come.

Market Quotations.

The enemies of trade journals, and, unfortunately, many of their friends who entirely mistake their functions, are generally very active in denouncing or reproving them during periods of declining markets. There are a few men in nearly every line of business, sometimes occupying positions of influence, whose one idea is that every buyer is a natural enemy, and that capacity to deal with him is measured by the success attained in deceiving him. This is the man whose business is booming when half his mill is idle, who represents the market as stiffening when he has offers out right and left to sell at unprecedented prices. He is the one who is always eager to pour into the ears of every journalist his tales of general prosperous trade, and of individual success. He is the one who becomes the violent enemy of the trade journal when he finds at last that while his tales are patiently listened to, they never reach the public. He is comparatively harmless, because his reputation protects those whom he attacks.

There are others who hold that the special function of trade journals is to hide bad news as long as possible and proclaim favorable developments with the utmost alacrity. When an advance has taken place it must be chronicled at once. A decline must be kept back, and quotations must remain stationary while still a stray buyer exists who has not heard of the lowering in prices. The true office of the trade journal, according to these critics, is to constitute the rear guard in retreat, and the picket line in every advance.

We hold that it is the function of the commercial reporter to seek the truth persistently and diligently, and to present it fairly and candidly. If developments are unfavorable, the sooner their significance is generally understood the better. It will make the weaker sellers quicker to abandon hope and will make buyers more watchful of their opportunity, thus aiding in steadying the markets. The idea that secrecy was the only safeguard of merchants and manufacturers has been long since abandoned in all the markets of the great staples, such antiquated business methods being now regarded as childish. No one attempts the dangerous and unsatisfactory rôle of being the special guardian of any commodity, protecting it against untoward declines, or blowing it up during its brief days of expansion.

A Century of Immigration.

As an appendix to the usual quarterly report, where it seems to have escaped attention, the Bureau of Statistics has published a very interesting paper on immigration into the United States from 1782 to 1892. It is estimated that from the close of the Revolutionary War until 1820, when the first official records were begun, the number of immigrants was 250,000. From 1820 to 1856 the official statistics of arrivals from foreign countries did not distinguish those intending to make their permanent residence in this country from merely transient passengers. During that time 4,212,624 immigrants arrived, of whom, it is estimated, 2 per cent. were sojourners. From 1856 to 1892, inclusive, the number was 12,371,959, so that, making due allowances, there have come to this country since the close of the Revolutionary War about 16,750,000 immigrants. This does not include the alien arrivals by way of Canada since July, 1885, since which time even approximate statistics have not been kept. Since then, according to Canadian sources, the number of European immigrants destined for the United States was 567,557.

From 1820 to 1892, inclusive, Germany contributed 4,748,440 immigrants, Ireland coming next, with 3,592,247, England with 2,534,955 and Scotland with 347,900, so that Great Britain sent 6,475,102 people. Norway and Sweden are down for 1,082,188, Austria-Hungary for 585,666, Italy for 526,749 and Russia and Poland for

517,507. In more than 70 years only 296,219 Chinamen are recorded as immigrants.

Of course the principal objection which is being raised in connection with recent immigration refers to its character. It has been evident to the most casual observer that a heavy percentage of those who now land on our shores are not physically, mentally and morally up to the average of immigrants in former decades. While during the fiscal year 1892 Germany still heads the list with 180,758, as compared with an average of 145,297 during the decade from 1881 to 1890, Russia has jumped to second place in 1892, with 84,393 immigrants, as compared with the decade average of 26,509. Italy follows with 63,137, against 30,731 average, and Austria-Hungary has risen to 80,136 over an average of 35,372 during the 1881-1890 decade. The Swedes and Norwegians have held their own, with 57,709 in 1892, and 56,836 for the decade average, while Ireland shows a drop to 55,467 in 1892, from 65,548 average during the ten years referred to. England, too, has fallen off from an average of 64,468 to 49,770 in 1892.

Some very interesting figures are presented concerning the amount of money brought by immigrants, the report covering the six months ending June 30, 1892. It appears from the returns of the Commissioner of Immigration that the 152,360 persons above the age of 20 years who arrived at the port of New York had with them \$3,060,908.05, or a *per capita* average of \$20.09. The accuracy of this figure may be questioned, of course, since it is doubtful whether the officials really succeed in getting at the truth, particularly when it is considered that many of the more ignorant people are apt to be very secretive concerning their resources. But even when that is taken into consideration, the total sum will be acknowledged to be very small indeed. Out of the whole number only 5814 are recorded as having brought more than \$100, while 146,546 had less than that sum.

The following table presents the data concerning the principal nationalities:

Money Brought by Immigrants.

	Number having more than \$100.	Number having less than \$100.	Average per capita.
Ireland.....	401	14,591	\$15.64
England.....	293	5,278	26.43
Germany.....	2,022	20,329	35.42
Russia.....	333	9,306	22.10
Poland.....	157	10,621	12.31
Sweden.....	514	12,725	21.69
Norway.....	148	4,846	18.70
Hungary.....	150	12,999	11.42
Austria.....	237	8,038	14.95

Concerning the Russian immigrants the report notes that there were the widest variations in financial condition. Of the 333 who were better situated, several brought considerable sums, one bringing \$25,000. The 9306 Russians who brought less than \$100 were nearly all destitute.

As a whole, therefore, the cash brought by the immigrants does not play the part in enriching this country which many have been inclined to give it credit for, even if the fact be taken into consideration that a good many have in their pockets railroad tickets for considerable journeys, which represent sums ultimately remitted by steamship companies and foreign agents to American transportation companies. It is sure that many times the amount which is brought from Europe by immigrants is spent annually by American travelers abroad.

CORRESPONDENCE.

The Quality of Steel Plates.

To the Editor: I have read your editorial of May 18 on the quality of steel plates, and find it interesting and timely.

There is a suspicion in the minds of many that, while the prices for boiler plate have openly and confessedly dwindled down to figures almost increditable, the quality has been made to degenerate in equal proportion, though with the secrecy and cowardly concealment of grocers' adulterations.

I have been engaged in the business of selling plates for 30 years, down from the time when C. H. No. 1 flange and puddled irons were the only qualities known, through the period when the early introduction of steel was accompanied by boasts of 80,000 pounds minimum tensile strength, to the present era of low tensility and exceeding ductility, with the old-fashione derminology of tank, shell, flange and fire box made the nomenclature for steel.

In this region, where, to say the least, prices rule as low as anywhere in the country, most boiler plates are bought and sold on the condition of physical tests, which follow the formula of the well-known Hartford requirements, and I do not believe there is a boiler maker in this circuit who would use steel not subject to these conditions, or without knowing in most cases that such conditions are absolutely fulfilled.

The conclusion from which would seem to be inevitable: that the steel is good in spite of low price; or that, if it is not good, the present system of tests is useless; or that, if the tests are trustworthy and the true earmarks of good material and yet affixed to steel of inferior quality, the manufacturer who affixes them to his output as true and honest evidence of the excellence of his plates is a cheat and a perjurer to boot, and should be sent to the penitentiary.

And there is the trace of a suggestion in your article which I hope to see drawn out in full discussion, to wit—If what is called tank steel shows test results equal to those of the best firebox; if any steel will show from 50,000 to 60,000 tensile strength, with contraction and elongation of 60 per cent. and 30 per cent. respectively, is it not good enough for boiler use, and, if it is not, are so-called physical tests of any account or value whatever? And, if physical and chemical tests put together are real measures of the strength and toughness of boiler material, why does one manufacturer of unblemished reputation make a difference of \$20 a ton in the selling price of his boiler plate when a low maximum of phosphorus is required as well as the ordinary high class pulling results; and why does another of equally high standing bid on the self-same specification, including chemical and all other tests, a price lower than the going rate in the market at that time for any steel, tested or untested?

My own experience leads me to be skeptical in relation to the value of tests, the worst development of steel's congenital tendency to crack, taking place after or before test, manifesting the highest excellence in regard to the modern quartette of tensility, elasticity, contraction and elongation, and I incline to the belief that, with high or low prices, the consumer can have but one ground for trust in the soundness of the material he buys—namely, the

skill of its maker and the honorable determination of the latter to furnish his customer what he agrees to give.

GEO. H. LLOYD.

BOSTON, May 19, 1893.

The Parisian Inventors' Academy.

To the Editor: I am informed that the Parisian Inventors' Academy is still circulating its proposals among American inventors and engineers of whom its promoters happen to find the addresses, offering them its "great gold medal" (gilded) for a \$10 "membership fee."

The thing is a representative humbug on its face, and it would seem hardly possible that it could deceive any one, but the fact that several acquaintances had been approached in this manner, and that at least one case, to my knowledge, had resulted in the exportation of gold to Europe in return for gilt, led me to ask a friend in Paris having special facilities for the investigation of such cases to make certain that the concern was a "fake." His report was promptly made, and was conveyed through articles in Parisian and other French newspapers to the French public as well. All that the American inventor is to expect is the "great gold medal" (gilded) from a concern composed mainly of brass. They do send the medal, I am told.

Very respectfully,

R. H. THURSTON.

ITHACA, N. Y., May 16, 1893.

Aluminum Horseshoes.

To the Editor: Referring to the article, "Aluminum Horseshoes," in your issue of May 18, I will say that they are quite common in this section on race horses. "Charley Moser," the crack shoer of this section, has made many sets, and they seem to give good satisfaction. He purchases the material in size and shape to suit and hammers them out cold. I have just been informed that he has orders for several sets now.

Those he makes wear well on the track and on clay roads. How they will do on street pavements has not been demonstrated.

TRUMBULL Co. (Ohio).

The achievements of the armored cruiser New York on her trial trip last Monday, on the Massachusetts coast, are regarded with a feeling of exultation, not only by the builders, who win a premium of perhaps \$200,000, but by the public at large. The entire course was 41.65 nautical miles, which was steamed over twice. On the first run the speed was 20.83 knots and the second 21.35, the difference being due to the tide, which was against the vessel on the trip north. The average of these speeds gives 21.09 knots, with a possibility of its being greater when the true current correction is added. Possibly some abatement will be claimed by the Government when the official record is known, but the comparison made by the best war steamers of the same class built in Europe is one that reflects credit on the skill attained by American engineers, artisans and naval constructors, and warrants high expectations of deeds yet to be accomplished.

The demand for labor in England is described as steady, with, in some cases, an upward tendency, though still below the average for the time of the

year; a fact which is largely attributable to the falling off in the engineering and iron trade. A comparison of the proportion of unemployed labor for the last four years shows a regular decline of employment. Thus in April, 1890, the proportion was 1.7; in 1891, 2.8; in 1892, 5.7; while in the present year it was 8.7.

Proposals are invited for the plans of construction of a steel office building of from 12 to 20 stories high to be erected on the present site of the *Herald* building on Broadway. The lofty structures, with a frame work of steel and iron, which are either in course of construction or proposed, will constitute the most conspicuous in architecture to be found in New York City.

Iron and Steel in the Western States.*

BY W. M. SWEET.

The statistics covering the operations of blast furnaces, iron and steel rolling mills, Bessemer, open-hearth and crucible steel works, iron ore forges and pig iron and scrap iron bloomeries, are given in the table following for the census years 1890, 1880 and 1870. In compiling the figures the geographical division of the Western States is considered as comprising the iron-making States of California, Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Oregon, Utah, Washington, Wisconsin and Wyoming.

In all comparisons with values reported in 1870, it should be borne in mind that the values of that year were expressed in a currency which was at great discount in gold. The average premium on gold during the 12 months (June 1, 1869, to May 31, 1870) which constituted the census year was about one-fourth (25.8 per cent.). A premium on gold of one-fourth is equal to a discount on currency of one fifth. For purposes of comparison, therefore, the values of 1870 should be reduced in that ratio. The statistics for 1880 included the capital invested and labor employed in iron ore and coal mining, limestone quarrying, and other similar branches of industry directly connected with the manufacture of pig iron, while these data are excluded from the tabulations for 1890. On the other hand, the statistics of "live assets," such as cash, bills and accounts receivable, and similar items of capital investment, are believed to be more fully reported for 1890 than at previous census inquiries. It will readily be concluded from the preceding statements that accurate comparisons of statistics relating to capital employed are impracticable.

Blast Furnaces.

In 1880 the furnaces of the Western States contributed a little over 26 per cent. of the total quantity of pig iron produced in the country that year, and in 1890 this section made over 27 per cent. of the total output, the small quantity of castings made direct from furnaces being included in each year.

* From advance sheets of the census report.

In the following table is presented a comparative statement of the blast-furnace industry of the Western States in the census years 1890, 1880 and 1870:

the increased yield of metal from ores. In 1880 the furnaces of the Western States are reported to have used a total of 1,697,233 tons of iron ore and 137,-

COMPARATIVE STATEMENT: 1890, 1880 AND 1870.

Blast Furnaces.

General heads.	1890.	1880.	1870.
Number of establishments	104	136	101
Capital invested	\$36,681,060 a7,628	\$27,618,395 11,332	\$13,169,826 8,111
Average number of hands employed	a7,628	11,332	8,111
Amount of wages paid	a\$3,715,649	\$4,183,483	\$4,183,539
Cost of materials used	\$30,935,275	\$17,153,649	\$11,420,353
Value of products	\$39,611,313	\$24,684,85	\$18,789,173
Tons of products	2,680,803	998,535	522,161

a Excludes officers or firm members, clerks or salesmen, and their salaries.

An accurate comparison of the growth of the blast-furnace history in the items of capital invested, hands employed and wages paid is not possible from the figures in the above table, since these items for 1880 include both the operations of blast furnaces and of the mining and other industries conducted in close connection with these works. In 1890 the amount of capital invested by blast-furnace companies in iron and coal lands and the hands employed and wages paid in mining, wood cutting and charcoal burning have been excluded from the tabular presentation for this period, being covered by other branches of census inquiry.

Materials Used by Blast Furnaces.

The quantities and costs of the materials consumed by the blast furnaces of the Western States during the census years 1890 and 1880 are given in the following table, the ton of 2000 pounds being used, except for charcoal, which is given in bushels:

366 tons of mill cinder, roll scale, and other materials, producing 998,535 tons of products, or an average yield of metal to the ton of these materials consumed of 54.43 per cent. In 1890 the consumption of iron ore was 4,135,281 tons, and of mill cinder and roll scale 336,561 tons. The production of pig iron and other products during the year amounted to 2,680,803 tons, showing an average yield of metal per ton of materials above mentioned of 59.95 per cent. The above quantities are all in tons of 2000 pounds.

Rolling Mills and Steel Works.

Of the 91 rolling mills and steel works credited to the Western States in the census year 1880, 77 were classed as iron rolling mills, 11 as Bessemer and open-hearth steel works, and 3 as crucible steel works. The 11 Bessemer and open-hearth steel establishments comprised 5 Bessemer and 6 open-hearth steel-making plants. In 1880 the roll-

COMPARATIVE STATEMENT: 1890 AND 1880.

Blast Furnaces.

Materials.	1890.		1880.	
	Quantity.	Cost.	Quantity.	Cost.
Total		\$30,935,275		\$17,158,649
Domestic iron ore (tons)	4,123,773	17,637,721	1,697,223	9,308,784
Foreign iron ore (tons)	11,508	62,558	624,508	621,395
Limestone (tons)	1,048,873	889,154	32,17	1,6,408
Anthracite coal (tons)	45	141	756,642	1,456,243
Bituminous coal (tons)	351,199	456,791	688,108	3,240,459
Coke (tons)	2,320,046	8,288,103	28,295,478	1,977,762
Charcoal (bushels)	35,841,190	2,138,186	137,366	366,284
Mill cinder, &c. (tons)	336,561	954,521		
All other materials		238,106		784

The development of the extensive deposits of high-grade ores in the Lake Superior district, in response to the demands of a rapidly growing steel industry, and the economies which the more extended use of coke has rendered possible in the manufacture of pig iron, have led to an important change in the character of the raw materials consumed by the blast furnaces in several of the Western States. In many districts the use of local ores containing a low percentage of iron has been abandoned for the richer Lake Superior iron ores, and in addition there has taken place a more general substitution of coke for the bituminous coal which was largely employed in 1880, either alone or as an important constituent of a mixed fuel of raw coal and coke.

The more careful selection of the material consumed in the manufacture of pig iron in 1890 is well illustrated in

ing of steel was confined almost entirely to works which produced the crude material, but with the more extended use of steel during the succeeding years, many of the iron rolling mills rapidly adapted their machinery for rolling steel as well as iron.

The 121 establishments situated in the Western States in 1890 consisted of 85 iron and steel rolling mills not connected with steel producing works, and 36 establishments which were equipped for the manufacture of crude steel. These 36 establishments comprised 20 Bessemer steel plants (including one Clapp-Griffiths and three Robert-Bessemer plants), 17 open-hearth steel plants, and six crucible steel plants. There were four of the establishments equipped for producing both Bessemer and open-hearth steel, and three for making both crucible and open-hearth steel. With the exception of seven establish-

ments, all the steel-producing works contained trains of rolls.

The comparative condition of the iron and steel rolling mills, Bessemer, Clapp-Griffiths, Robert-Bessemer, open-hearth and crucible steel works during the census years 1890, 1880 and 1870, is shown in the following table:

COMPARATIVE STATEMENT: 1890, 1880 AND 1870.

Rolling Mills and Steel Works.

General Heads.	1890.	1880.	1870.
Number of establishments.....	171	91	49
Capital invested.....	\$71,389,691	\$24,441,508	\$12,082,622
Average number of hands employed.....	833,74	23,994	8,595
Amount of wages paid.....	\$19,304,329	\$10,610,298	\$5,155,092
Cost of materials used.....	\$60,772,679	\$37,270,215	\$13,967,436
Value of products.....	\$89,440,208	\$53,623,539	\$21,981,736
Tons of products.....	2,392,536	941,644	242,119

a Excludes officers or firm members, clerks or salesmen, and their salaries.

The apparent increase in the aggregate capital invested in rolling mills and steel works from 1880 to 1890 was 192.08 per cent. During the same period the tonnage of products increased 154.08 per cent., although the percentage of increase in the total value of finished products, owing to the decline in the selling prices of iron and steel, was only 67.73 per cent.

During the decade from 1880 to 1890 the aggregate daily capacity in finished products of the rolling mills and steel works of this section increased from 6550 net tons to 14,153 net tons. The number of single puddling furnaces increased from 958 to 1142, heating furnaces from 577 to 671, Bessemer converters (including Clapp Griffiths and Robert-Bessemer) from 10 to 37, open-hearth furnaces from 12 to 38, crucible pots per heat from 71 to 116, hammers from 88 to 129, cut-nail machines from 771 to 2409, and trains of rolls from 300 to 406.

Products of Rolling Mills and Steel Works.

The total tonnage of the iron and steel products of the rolling mills and steel works of the Western States in 1890 and 1880 is given in the following table, the unit of quantity being the ton of 2000 pounds.

Comparative Statement of Tonnage of Products—1890 and 1880. Rolling Mills and Steel Works.

Products.	1890.	1880.
Iron.....	977,655	616,661
Bessemer steel.....	1,344,511	302,605
Open-hearth steel.....	67,215	21,868
Crucible steel.....	3,155	490
Total.....	2,392,536	941,644

The increase in the tonnage of products during the past ten years was 1,450,892 tons, or 154.08 per cent. This growth has been principally in steel, iron products having increased only 58.54 per cent., while the steel products increased 335.37 per cent. In 1880 the percentage of the products of iron was 65.49 and of steel 34.51, while in 1890 the output of steel products was 59.14 per cent. and the iron products 40.86 per cent. of the total production of that year. The small quantity of Clapp-Griffiths and Robert-Bessemer steel made in 1890 is included in the output of Bessemer steel.

Materials Used by Rolling Mills and Steel Works.

The total cost of all the materials consumed by the rolling mills and steel works of the Western States in 1890 was \$60,772,679, against \$37,270,215 in 1880. The principal materials con-

point of the furnace men Southern makers may lose a limited market in Pennsylvania and other interior points, which they will seek to make up in the Eastern States. The great bulk of their tonnage goes to the West. This business will not be interfered with. The Northern makers will lose certain business from the manufacturers of iron and steel, who will be discriminated against in Southern markets.

The point has been made by certain Philadelphia papers and spread broadcast throughout the country that this advance will interfere seriously with the pig-iron business, owing to the contracts extending into the summer and fall, on which there would be a loss to the furnace men equal to the amount of the freight.

About 16 years ago the Southern pig-iron interests, feeling that their industry was being kept down by lack of railroad facilities and the uncertainty of established freights, made an agreement with the railroads, at a meeting held in Chattanooga, for a sliding scale to extend ten years. After the expiration of this scale the railroads adopted the precedent of protecting contracts. This is in force to-day. When a bill of iron is sold for future delivery the matter is reported to the Southern Railroad & Steamship Association, by whom it is recorded. The rate ruling at the time the matter is reported continues in force during the life of the contract.

About a year ago the Pennsylvania Railroad Company advanced their rate on Southern pig at the solicitation of Northern makers. At this time, as heretofore, the Southern furnace men were protected by their railroads. However, in this case they equalized the reduction after the expiration of the then existing contracts, by a reduction in price. It is not probable that they will make further concessions on business not now contracted for, owing to the very low price which rules at the present time.

The Advance in Pig-Iron Rates

On June 1 Southern railroads will advance the rates of Southern pig iron consigned to Pennsylvania and Eastern points from 50 to 70 cents per ton in order to meet the arbitrations imposed by Northern roads. Southern roads will not profit by the increase in rates. Their Northern connections take this action at the instigation of Northern pig-iron manufacturers, who, it is claimed, are not able to meet Southern competition at present prices. We understand that certain of these furnaces have notified the railroads that an advance must be made or they will be forced to close down. Inasmuch as it was a question of a very heavy tonnage, the railroads have been forced to take this action.

There is considerable feeling over the matter among Southern pig iron makers, which is said to be reflected by the Southern railroads. Retaliatory measures are already talked of. A director of one of the leading Southern companies informs us that Southern furnaces have favored the railroads, in consignments to Northeastern points which could have been reached by water competition, believing that they needed the assistance. Hereafter much of this tonnage will be sent by water. This will include iron used in New Jersey, New York City and vicinity and by all of the Eastern trade.

We understand that the Southern railroads will also inaugurate a retaliatory policy by advancing the freight on manufactured iron and steel, large amounts of which reach the Southern centers. From a railroad standpoint the advance is as broad as it is long. From the stand-

OBITUARY.

GEORGE SANDERSON.

Members of the hardware, iron and steel trades will doubtless remember George Sanderson, who, it is said, at the time of his decease, May 6, was the oldest representative of the Sheffield steel trade in New York. Mr. Sanderson was about 85 years of age. He came to this country in 1849 as the first agent of S. & C. Wardlow and represented them until 1867, when he went into business for himself, associating with him John Askham of Sheffield, a manufacturer of tool steel. Mr. Sanderson looked after the interests of the concern in this country, while Mr. Askham attended to the manufacturing part of the business. This partnership was dissolved in 1879. In 1883 Mr. Sanderson retired from business. He was well-known, we are advised, to the cutlery and saw manufacturers on this side of the Atlantic. The late Henry Disston is said to have purchased his first pound of saw steel from him, and there existed a warm friendship between the two men until Mr. Disston's death.

Reports from Washington are to the effect that the pneumatic guns on the Vesuvius are so imperfect that the whole system will probably be abandoned and the vessel be adapted to another service.

The Cost of Producing Pig Iron by the Thomas Iron Company from 1855 to 1892.*

TONS 2240 POUNDS.

Six months ending	Cost per ton.			Amount used per ton ¹ pig.			Cost per ton pig.			Quality and quantity.				Total product.	Running time, weeks.	Days.			
	Coal.		Ore.	Coal.		Ore.	Coal.		Ore.	Coal.		Labor, repairs, &c.	Total cost.	1 X.	2 X.	No. 2.	No. 3.		
	T.	Lbs.	T.	Lbs.	T.	Lbs.													
December, 1855	\$3.10	\$3.59	\$0.63	2	968	2	1,252	1	1,357	\$7.55	\$9.50	\$0.98	\$2.54	\$20.57	.....	.....	6,445	39	5
June, 1856	2.95	3.75	.57	2	835	2	1,353	1	834	7.00	9.61	.78	3.08	20.47	.....	.....	10,606	52	5
December, 1856	2.89	3.65	.54	2	580	2	892	1	976	6.50	8.76	.73	2.19	21.97	.....	.....	6,838	40	5
June, 1857	2.84	3.49	.52	2	465	2	858	1	630	6.27	8.34	.87	4.08	19.37	.....	.....	10,534	51	5
December, 1857	2.70	3.30	.52	2	336	2	804	1	537	6.02	7.72	.85	4.23	18.61	.....	.....	7,583	39	5
June, 1858	2.54	2.88	.43	2	11	2	813	1	544	5.09	6.68	.54	3.49	15.80	.....	.....	7,732	32	4
December, 1858	2.43	2.81	.27	1	2,175	2	566	1	699	5.80	6.33	.48	2.55	15.16	.....	.....	12,252	52	5
June, 1859	2.42	2.62	.34	2	161	2	701	1	733	2.02	6.06	.46	2.85	14.39	.....	.....	11,764	49	5
December, 1859	2.39	2.61	.34	2	170	2	870	1	500	4.97	6.23	.41	4.29	15.91	.....	.....	10,429	52	5
June, 1860	2.44	2.69	.35	1	2,058	2	885	1	778	4.68	6.23	.47	4.13	15.50	.....	.....	11,155	46	5
December, 1860	2.45	2.58	.30	1	1,849	2	633	1	655	4.58	6.52	.46	2.46	14.02	.....	.....	13,669	52	5
June, 1861	2.37	2.70	.34	1	2,218	2	685	1	854	4.72	6.23	.47	2.58	14.00	.....	.....	13,219	51	5
December, 1861	2.38	2.62	.33	2	85	2	627	1	789	4.82	5.98	.44	2.34	13.58	.....	.....	13,774	52	5
June, 1862	2.37	2.39	.34	2	58	1	531	1	824	4.79	5.34	.47	2.45	13.05	.....	.....	12,784	72	1
December, 1862	2.70	2.63	.32	2	323	2	363	1	547	5.80	5.69	.41	2.11	14.01	.....	.....	17,902	77	1
June, 1863	3.80	2.80	.45	2	224	2	676	1	737	7.99	6.00	.60	4.45	19.03	.....	.....	16,968	78	1
December, 1863	4.92	3.03	.49	2	579	2	909	1	978	11.11	7.29	.71	4.94	24.05	.....	.....	18,724	102	1
June, 1864	5.68	3.59	.55	2	435	2	871	1	1,112	12.42	8.59	.83	4.65	26.48	.....	.....	23,317	95	4
December, 1864	7.05	4.79	.73	2	777	2	949	1	1,427	16.51	11.60	1.16	6.80	36.07	.....	.....	21,162	95	4
June, 1865	6.13	4.68	.80	2	907	1	1,186	1	1,416	14.75	11.78	1.30	6.64	34.48	.....	.....	14,320	68	5
December, 1865	5.69	4.72	.69	2	442	2	751	1	1,288	12.06	10.87	1.04	5.73	29.70	.....	.....	17,189	72	1
June, 1866	4.85	4.84	.76	2	262	2	758	1	1,078	10.27	10.11	1.13	5.67	27.18	.....	.....	23,496	101	1
December, 1866	4.44	4.94	.74	2	605	2	523	1	1,116	10.07	11.02	1.11	5.16	27.38	.....	.....	23,556	96	4
June, 1867	4.00	4.90	.72	2	903	2	687	1	1,065	9.61	11.30	1.07	5.98	27.97	.....	.....	22,153	96	4
December, 1867	3.54	4.56	.75	2	890	2	642	1	1,207	8.57	10.43	1.16	4.99	25.14	.....	.....	24,987	104	1
June, 1868	3.41	4.60	.76	2	466	2	875	1	1,140	7.53	11.00	1.14	6.54	26.21	.....	.....	26,214	100	6
December, 1868	4.14	4.53	.78	2	436	2	787	1	1,011	9.00	10.64	1.17	6.52	27.38	.....	.....	27,448	124	5
June, 1869	4.16	4.66	.79	2	132	2	554	1	1,366	8.57	10.47	1.27	5.24	25.56	.....	.....	28,808	130	5
December, 1869	4.95	4.98	.82	2	80	2	375	1	1,345	10.07	10.79	1.30	6.11	28.27	.....	.....	33,352	155	5
June, 1870	3.93	4.89	.81	1	2,001	2	489	1	1,059	7.53	10.85	1.20	5.05	24.62	.....	.....	33,353	156	5
December, 1870	3.78	4.72	.81	2	32	2	579	1	1,087	7.61	10.66	1.20	5.41	24.41	.....	.....	33,507	156	5
June, 1871	4.23	4.88	.79	2	61	2	814	1	1,161	8.59	11.48	1.20	8.08	29.33	.....	.....	16,313	86	3
December, 1871	3.71	4.98	.73	1	2,032	2	493	1	916	7.18	11.05	1.03	3.84	23.12	.....	.....	36,301	156	5
June, 1872	3.69	5.24	.74	1	1,921	2	252	1	944	6.84	11.59	1.05	4.60	24.03	.....	.....	32,167	156	5
December, 1872	3.75	6.22	.75	2	118	2	749	1	1,361	7.69	14.51	1.20	5.76	29.20	.....	.....	32,676	156	5
June, 1873	8.85	5.95	.75	1	2,039	2	471	1	1,410	7.36	13.15	1.20	7.40	29.11	.....	.....	26,420	131	9
December, 1873	3.85	6.02	.73	2	60	2	796	1	1,412	7.82	14.21	1.20	5.50	29.74	.....	.....	19,521	109	3
June, 1874	3.86	5.88	.66	1	2,138	2	799	1	1,140	7.39	13.64	1.00	5.41	27.49	.....	.....	21,592	100	3
December, 1874	3.86	5.75	.61	1	1,853	2	183	1	771	7.06	11.98	1.00	5.21	25.14	.....	.....	21,326	104	3
June, 1875	4.28	5.30	.57	1	1,904	2	178	1	737	8.12	11.03	.76	3.82	23.74	.....	.....	21,372	92	3
December, 1875	3.41	5.19	.55	1	1,678	2	1,214	1	352	5.99	10.12	.64	3.56	20.32	.....	.....	23,001	92	3
June, 1876	3.36	4.89	.52	1	1,412	1	2,137	1	231	5.39	9.54	.58	2.49	18.06	6,939	12,164	4,927	230	5
December, 1876	2.85	4.40	.50	1	1,769	2	343	1	602	5.11	8.98	.64	2.60	17.33	4,380	12,226	11,202	745	28,553
June, 1877	2.63	4.00	.49	1	1,526	2	131	1	500	4.42	8.20	.59	2.29	15.50	6,428	10,851	13,854	3,032	34,165
December, 1877	2.53	3.73	.49	1	1,705	2	211	1	549	4.58	7.83	.61	3.19	16.21	6,228	9,231	12,134	2,361	29,954
June, 1878	2.08	3.50	.50	1	1,476	2	183	1	743	4.43	7.29	.66	2.09	14.47	8,547	13,560	13,806	1,379	27,283
December, 1878	2.78	3.25	.46	1	1,257	2	241	1	610	4.31	6.83	.58	2.64	14.36	5,409	13,095	6,946	613	26,063
June, 1879	2.58	3.11	.44	1	1,420	2	81	1	499	4.25	6.34	.54	2.46	13.59	4,815	10,394	15,544	1,235	31,883
December, 1879	2.63	3.52	.45	1	1,409	1	2,180	1	314	4.29	6.60	.51	2.47	13.37	6,895	11,253	28,388	2,771	49,307
June, 1880	3.41	4.19	.49	1	1,593	1	315	1	376	5.77	7.94	.56	2.24	16.51	9,399	12,261	25,647	3,298	50,605
December, 1880	3.58	3.79	.49	1	1,818	2	316	1	944	6.48	8.25	.70	2.04	17.47	9,337	14,991	22,762	1,809	48,899
June, 1881	3.57	4.88	.51	1	1,671	2	391	1	843	6.23	8.28	.70	2.21	17.42	14,098	19,510	19,352	1,800	53,760
December, 1881	3.54	3.79	.55	1	1,558	2	109	1	803	6.10	7.99	.73	3.01	17.73	8,334	15,235	19,700	2,481	45,754
June, 1882	3.52	4.10	.53	1	1,337	2	143	1	695	5.63	8.34	.68	2.88	17.48	10,760	16,739	23,812	3,578	54,909
December, 1882	3.52	5.54	.52	1	1,421	2	140	1	607	5.74	7.89	.66	3.18	17.48	12,483	19,407	20,051	3,763	55,708
June, 1883	3.78	3.70	.51	1	1,352	2	192	1	468	5.62	7.74	.62	2.93	17.01	13,675	21,339	20,491	2,217	57,722
December, 1883	3.38	3.92	.47	1	1,263	2	102	1	210	5.29	7.29	.51	2.76	15.85	14,445	16,183	11,953	1,296	45,857
June, 1884	3.28	3.20	.44	1	1,227	2	132	1	113	5.06	6.92	.46	2.46	14.90	14,328	18,875	14,856	1,774	44,834
December, 1884	2.82	2.97	.44	1															

MANUFACTURING.

Iron and Steel.

Morris & Bailey, manufacturers of cold-rolled steel in Pittsburgh, have made application for a charter of incorporation. The incorporators are: W. J. Morris, Robert Bailey, J. D. Hailman, F. K. McCance and F. J. Wetherell of Boston.

S. E. Wilcox of Philadelphia was in New Castle, Pa., recently for the purpose of presenting to blast-furnace operators in the Shenango Valley a process for making paving from blast-furnace slag. In this process the molten cinder is run into sand and allowed to cool in blocks of different sizes.

The Lehigh Steel & Iron Company of Allentown, Pa., successors to the Lehigh Iron Company, are now operating the blast furnaces of that concern. It is reported that the new firm have under contemplation the erection of a steel plant, the building of which will probably be commenced during the latter part of this year or early next year.

One of the furnaces of the Burden Iron Company, at Troy, N. Y., has blown out for the purpose of being relined. Other improvements are also to be made at the furnace, and it will probably be three months or more before operations are resumed.

The Pacific Iron & Nail Company report that they will start up their works at Oakland, Cal., again in August or September, after repairs have been completed. They state that the outlook with them for business in the nail trade is very promising, and deny the report recently circulated to the effect that their plant had ceased operations altogether or would be removed to some other locality.

At the annual meeting of the stockholders of the Lima Steel Casting Company, Lima, Ohio, held on the 10th inst. the following directors were elected: James Langan, George W. Dismay, W. T. Agerter, T. T. Mitchell, J. W. Maxwell, William Roberts, H. D. Campbell, T. K. Jacobs and C. M. Hughes, Jr. The report of operations for the past year showed that the concern had been very prosperous.

Announcement is made that Carrell & Redfern, lessees of the Pioneer Furnace, at Negaunee, Mich., have blown it out and that the plant will be dismantled, after having been in continuous operation over 40 years, making a very high grade of charcoal pig iron.

Press dispatches from Knoxville, Tenn., state that articles incorporating the La Follette Coal & Iron Company, with a capital of \$2,500,000, and the La Follette Land & Improvement Company, with a capital of \$1,500,000, have been filed at that place. Among the incorporators are the Hon. H. M. La Follette, president of the Fidelity Savings Union, Sterling; Paul Skeller, banker, Philadelphia; B. H. Enos, and A. E. Davis of New York. Fifty thousand acres of coal, iron and timber lands have been purchased in Campbell County, including the Big Creek Gap property, and electric plants with a capacity of 10,000 tons daily are to be used in mining the coal. One thousand coking ovens and iron furnaces with a capacity of 1000 tons daily will be erected, and an industrial town, to be known as La Follette, will be built on the company's property. It is further stated that a syndicate of English and Holland capitalists will build a railroad from Cumberland Gap to Chattanooga and Atlanta, giving the company an outlet for their products.

Notice of pendency of an action in foreclosure proceedings has been filed by Stone, Gannon & Petit for the Onondaga, N. Y., Savings Bank against the Onondaga Iron Company, whose works are situated at Geddes, N. Y.. The bank holds a mortgage against the property, which originally amounted to \$150,000. In the papers it is said that \$100,000 interest from January 1 is now due. The mortgage was given on September 1, 1885, and was to bear 5 per cent. interest. A bond amounting to \$300,000 was given with the mortgage.

It is reported that the Troy Steel & Iron Company will make extensive improvements in their plant at Troy, N. Y.

The Fidelity Trust & Safe Deposit Company of Philadelphia have been appointed receivers of the Powelton Iron Company, which was formed in 1889 by the creditors of the firm of Robert Hare Powel & Co. and Robert Hare Powel's Sons & Co., who made an assignment in 1887. The

real estate of the Powelton Iron Company was sold by the sheriff last August, and a receiver was asked for to take charge of the books and papers of the company and collect certain assets.

The partnership heretofore existing between W. H. Miller and Nat H. Van Winkle, known as Miller & Van Winkle, having been dissolved by the death of Nat H. Van Winkle, March 18, 1893, W. H. Miller, having purchased the interest of his estate, will continue the business under the same firm name at 18 to 24 Bridge street, Brooklyn, N. Y. Mr. Miller was the senior partner when the firm was established in January, 1884, having been connected prior to that time with the Eagleton Mfg. Company. The New York office has been recently removed to the Brooklyn Works. The firm make a specialty of all kinds of steel wire springs for all purposes, flat steel, round wire, tempered and untempered.

The puddlers and helpers in the rolling mill of Morrison, Colwell & Page of Cohoes, N. Y., about 100 in number, are on a strike on account of the refusal of a 50-cent advance on a ton in certain classes of work. It is said that they have quit work in violation of an agreement made six months ago. The men claim that the iron they are obliged to work is too heavy for the wages. A scale of prices was adopted last December, but they claim it has not been lived up to. The present scale, which was signed for a year, calls for \$3.50 and \$3.75 per ton. The men ask for \$4 per ton.

The Phoenix Horse-Shoe Works, at Poughkeepsie, N. Y., have been inconvenienced of late by 16 boy strikers who were employed in the mill. They had been receiving from \$4.50 to \$6 a week and demanded \$1 more. In the emergency of their leaving the mill, the heaters stepped forward and did their work until a number of Italians were secured to take the strikers' places. The Italians have been threatened with violence, but at last reports matters had quieted down.

No. 1 furnace of the Lehigh Iron & Steel Company, at Aineyville, Pa., which has been idle for a long time, was put in operation last week.

The project to erect a large steel mill at Sharon, Pa., will not be allowed to die out if the energetic men at the head of the enterprise adhere to their present statements. The scheme is still under discussion, and everything at present points to its successful completion.

The Mahoning Valley Iron Company and the Union Iron & Steel Company of Youngstown, Ohio, each being engaged in rerolling steel rails into small billets, have applied for a patent on the invention. A patent on a similar device has been issued to Charles Bryson of Pittsburgh.

Machinery.

The Union Switch & Signal Company of Pittsburgh have notified the stockholders that a special meeting will be held on June 14 for the purpose of holding an election for or against an increase of the indebtedness of this company by the issue of new bonds secured by a mortgage to the amount of \$300,000, the said proposed new issue of bonds or the proceeds thereof to be applied to the retirement of the existing mortgage indebtedness of the company.

Thomas Carlin's Sons of Allegheny, Pa., recently furnished to Hartley & Marshall, coal operators at Banksburg, Pa., a compound condensing engine with cylinders 10 x 24 inches and 20 x 24 inches. With steam at 50 pounds, cut-off at five-eighths stroke, a 25-foot fan, water gauge seven-tenths, is operated and furnished 100,000 cubic feet of air per minute. The fuel consumed is 1850 pounds of nut coal per day of 20 hours.

The Bellaire Boiler & Bridge Company of Bellaire, Ohio, have been reorganized and a new Board of Directors elected, as follows: H. A. Lichtenberger, Samuel Simmons, John Adams, Louis Grella and Edward Blackburn.

The Hazelton Boiler Company of New York City, manufacturers of the Hazelton porcupine boiler, have recently opened a branch office in the Westinghouse Building, Pittsburgh, Pa., in charge of H. A. Brown.

The courts at Pittsburgh last week granted a decree for the dissolution of the Pittsburgh Electric Scale Company.

The Pittsburgh Locomotive Works of Pittsburgh, Pa., will furnish during this month to the Pittsburgh & Lake Erie Railroad three ten-wheel connected engines. The

same firm have recently built for the Vandalia lines three ten-wheel engines, one of which is on exhibition at the World's Fair. The cylinders are 72 inches and the engines weigh 67½ tons each.

Brown & Co., Incorporated, of the Wayne Iron & Steel Works, at Pittsburgh, are installing 1000 horse-power of Babcock & Wilcox boilers. The boilers are equipped with the Brightman stokers, furnished by the Brightman Stoker Company of Cleveland, Ohio, through Samuel W. Hay, Pittsburgh representative.

About three years ago Wells Bros. & Co., manufacturers of dies, screw plates, &c., whose business had outgrown their facilities, planted a new shop just on the edge of the most populated part of Greenfield, Mass. They erected a model factory all on the ground floor, constructed on the slow-burning plan, with roof and sides largely of glass and an equipment embracing the best improvements. Wells Bros. & Co. are about to add to their shop sufficient space to make up a total of 30,000 square feet, and this is designed to enable them to fill orders more promptly, their storerooms being at present depleted of many sizes and styles.

The Ames Iron Works of Oswego, N. Y., intend to make extensive changes and improvements at their plant in that city during the coming summer, provided that the Common Council of the city will give them permission to lay certain side tracks.

The Rome Locomotive & Machine Works of Rome, N. Y., have been incorporated. The objects are to manufacture and sell railroad locomotives, portable and stationary engines, cars, machinery, &c. The capital stock is \$150,000, and the directors for the first year are: Thomas H. Stryker, Edward Comstock of Rome, William B. Isham, Henry A. V. Post and Ralph N. Ellis of New York City.

The hand riveters in the boiler department of the Brooks Locomotive Works, at Dunkirk, N. Y., recently asked for an increase of 10 per cent. in their wages. It is said that an increase of 5 per cent. has been offered and that all boiler makers shall receive the same wages, instead of being paid in three grades, as heretofore.

The report that the Schenectady, N. Y., Locomotive Works would be removed to Poughkeepsie, N. Y., is denied at the shops. The big plant has been one of Schenectady's chief industries for years, and its loss would be severely felt.

The G. A. Gray Company of Cincinnati, Ohio, have issued two heavy plates showing their spiral-gearred planer, of which they manufacture five standard sizes.

Graham Brothers' foundry and machine shops, at Worthington, Ind., have been burned, at a loss of \$20,000.

The Howard Furnace Company of Syracuse, N. Y., have plans prepared for the new works which they propose to erect at that place. They provide for two structures, each 100 feet square, one four stories in height, to be used as a general building, and the other as a foundry.

The floods at Erie, Pa., are the most destructive ever known in that city. The damage to the Jarecki Mfg. Company's plant is reported as not less than \$100,000, while the total loss caused by water is placed at over \$500,000.

A. W. Colwell, who makes a specialty of sugar, chemical salt and molasses machinery, has removed to new offices at 39 Cortlandt street, New York.

Among the sufferers by the flood in Western Pennsylvania are the Ball Engine Works in Erie, which are partly wrecked. Estimated loss, \$15,000.

The plant of the Goshen Pulley Company, at Goshen, Ind., has been sold by order of the court to John Dawson, of Chicago, for \$8000. The purchaser was a former member of the firm and held a judgment against the company for \$15,000.

The William Wright Steam Engine Works of Newburg, N. Y., have placed a 750 horse-power cross compound engine in the Meadow mill of William E. Hooper & Sons, at Woodberry, Md.

John Royle & Sons, Paterson, N. J., who manufacture improved silk machinery and rubber tubing machinery, as well as making special machinery to order, are making an addition to their plant of a three-story 25 x 75 building for storage purposes.

The new foundry at the works of the Lloyd Booth Company of Youngstown, Ohio, is fast nearing completion. The large crane is now erected and the cupolas are being placed in position this week.

TRADE REPORT

The collection of outstanding accounts has been the matter of chief concern lately, and reports from merchants and manufacturers who could be relied upon to speak frankly are to the effect that collections are unexpectedly good considering the circumstances. Instances are cited in which an angry spirit has been shown when creditors made searching inquiries concerning financial standing, but usually such a reasonable course has been met in an open, business-like manner. The conviction is evidently growing in the Iron trade that it is in a sound condition, although there is very little bragging concerning profits.

The magnate in the steel trade is credited in the daily press with gloomy forebodings concerning the immediate future of the business, which are somewhat at variance with the orthodox encouraging talk coming from the same camp.

The conspicuous feature all along the whole line is the extremely cautious attitude of buyers, who are covering only immediate requirements, so that the markets have an appearance of dullness even greater than aggregate sales would seem to warrant. Still, it remains a fact that a good deal of construction and building work has been knocked on the head for this season by the prevailing timidity of capital. The check to new enterprises through the condition of financial affairs is curtailing consumption.

The question which is now uppermost in the minds of manufacturers and merchants is whether production will be sharply restricted by labor troubles in the Western mills.

Some of the non-union mills in the West, and some of the Eastern works, with their lower range of wages, had led the Western union mills a merry dance in all the leading markets. Costs must be equalized to retain position in the markets. It is unreasonable to pay wages on a sliding scale with a minimum of 2¢ for Bar Iron when the product is actually selling at 1.40¢ @ 1.50¢ at mill. There is not enough money in the business to create eagerness for running mills.

There are so many non-union mills in the West, and so many eager sellers in the East, that a stoppage of the union mills is not likely to create a boom in prices which will tempt some of the fighting manufacturers to break from the ranks. With some of their leading competitors free from the Amalgamated Association, a number of the very large works in the West may see fit to seize the occasion for shaking off the yoke entirely.

Buyers will view the chances of a prolonged contest with more indifference than usual, as so many producers, East and West, will go on without any interruption that no actual scarcity need be apprehended.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street,
CHICAGO, May 24, 1893.

The Iron trade in this vicinity has been remarkably quiet during the past week. A few more failures were announced, showing that liquidation continues. Manufacturers and merchants are congratulating one another on the strength shown in this crisis. Extreme stringency prevails in the money market in consequence of the policy of the banks in curtailing discounts and accumulating heavy reserves to meet possible demands from depositors. It is stated that never before were the Chicago banks in the possession of so much cash as they now hold. This is little comfort to the community, however, when it is not available for commercial purposes. Lack of confidence seems to be more apparent in banking circles than among business houses.

Pig Iron—Merchants report that their principal occupation at present is making collections. New business is slow, and every effort is being made to obtain money due on past transactions. It is possible that this is one of the periods in which very little buying would be done anyhow, but the financial conditions give the dullness special importance. Northern and Southern Coke Iron are equally neglected. Prices are unchanged, as sellers believe it is useless to offer inducements while existing conditions prevail. Lake Superior Charcoal is also quiet, but sellers report the market hardly as firm as it has been. Negotiations in progress some time since are not in any immediate prospect of being closed, as consumers evidently believe that they will lose nothing by deferring their purchases. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$16.50	@ \$17.00
Local Coke Foundry, No. 1	13.75	@ 14.25
Local Coke Foundry, No. 2	13.00	@ 13.25
Local Coke Foundry, No. 3	12.75	@ 13.00
Local Scotch	14.00	@ 15.00
Ohio Strong Softeners	16.00	@ 16.50
Southern Silvery, No. 1		@ 15.00
Southern Silvery, No. 2		@ 14.50
Southern Coke, No. 2	12.85	@ 13.25
Southern Coke, No. 3	12.35	@ 12.75
Southern, No. 1, Soft	12.85	@ 13.25
Southern, No. 2, Soft	12.35	@ 12.75
Southern Gray Forge.....	11.85	@ 12.25
Tennessee Charcoal, No. 1	16.50	@ 17.00
Alabama Car Wheel		@ 18.85
Coke Bessemer.....	14.50	@ 15.00
Hocking Valley, No. 1	16.75	@ 17.00
Jackson County Silver.....	16.75	@ 17.00

Through an oversight our quotations on local and Southern Foundry Pig Iron were confused last week, but the correct figures are now given. As the quotations were merely transposed, it is likely that our readers themselves perceived the errors made.

Bars.—A fair volume of business is reported in Bar Iron, but with prices very irregular. The usual quotations continue of 1.50¢ @ 1.53¢, Chicago, for Common Iron, but this is shaded according to the condition of the seller. The Valley mills appear to be maintaining a firm attitude on the basis of 1.40¢ at mill, but competitors in other localities are making sales at somewhat better rates. Buyers who need a limited range of sizes, or who are willing to take the chances of prompt deliveries, are favoring such mills. Season contracts are being discussed, and in some cases considerable quantities are mentioned, but there is not much prospect of business in this line being closed very soon. Negotiations will be prolonged considerably further than usual.

Manufacturers show a general disinclination to make contracts for delivery after July 1, anticipating labor troubles at that time. Within the past few days inquiries for carloads and somewhat larger quantities have increased considerably, which is, perhaps, due to the growing belief that there really will be a general stoppage at the time mentioned. Soft Steel Bars seem to be sustained better than Iron, and continue to be quoted at 1.63¢ @ 1.70¢, Chicago, for mill shipment. Small lots from store are rather steady at 1.65¢ @ 1.75¢ for Iron and 1.75¢ @ 1.85¢ for Soft Steel.

Structural Material.—Very little is doing in shipments from mill. The Lake street elevated stations will require a few hundred tons of Angles and other shapes, but bridge work generally is quite dull. A fair business is in progress in Beams and other building material from yard and warehouse, which keeps working forces well engaged and compensates to some extent for the absence of large contracts. The demand of this character shows very steady growth and is expected to keep up well during the building season. Mill shipments, Chicago delivery, are quoted as follows: Beams, 1.85¢ @ 1.95¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.85¢ @ 1.90¢. Small lots from stock sell at 15¢ @ 20¢ $\frac{1}{2}$ 100 above these prices.

Plates.—Business is very quiet, with nothing doing to really test values. Prices, therefore, are nominally unchanged. Quotations on mill shipments, Chicago delivery, are as follows: Tank Steel, 1.80¢ @ 1.90¢; Shell Steel, 2.05¢ @ 2.15¢; Flange Steel, 2.20¢ @ 2.30¢; High Grade Fire Box, 2.75¢ @ 5¢. Store prices are as follows: Nos. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.20¢ @ 2.40¢; Shell, 2.35¢ @ 2.50¢; Flange Steel, 2.60¢ @ 2.80¢; Boiler Tubes, 67½ % @ 70 %.

Sheets.—Manufacturers' agents continue to report the mills well sold up, and are inclined now to ask slightly higher prices on carload lots for mills shipment. It is possible that No. 27 Common may still be had at 2.85¢, Chicago, but there are certainly few sellers at this price. Steel Sheets continue to be quoted at 10¢ @ 15¢ $\frac{1}{2}$ 100 advance on Iron. Galvanized Iron is moving only in a moderate way, with mill shipments of Juniata quoted at 70 and 16 % discount. Sheet Copper is quiet, with small lots quoted at 30 and 5 % discount.

Merchant Steel.—No new developments are reported in this line. Smooth-Finished Open Hearth Machinery is selling at 1.90¢ @ 2.10¢, Chicago, for mill shipment. Open-Hearth Spring Steel is steady at 2¢ @ 2.20¢. Buggy or Smooth-Finished Tire is unchanged at 2¢ @ 2.10¢. While Iron Finished Tire is still quoted at 1.70¢, with Bar Iron extras. Ordinary Tool Steel remains at 6¢ @ 7¢, with Specials at 12¢ upward.

Rails and Track Supplies.—Some large transactions in Steel Rails reported under negotiation last week have not yet been closed, but prospects are excellent for the early completion of such sales. The outlook continues encouraging for this branch of business and manufacturers feel assured of sufficient work to keep the mills reasonably well employed for some time to come. The situation is, however, not what it should be at this time of the year, and the condition is merely better by comparison with the dullness of the past.

Prices are firm at \$30 @ \$32, according to quantity. Iron and Steel Splice Bars are unchanged at 1.65¢ @ 1.70¢; Track Bolts with Hexagon Nuts, 2.60¢ @ 2.65¢; Spikes, 1.90¢ @ 2.05¢.

Old Rails and Wheels.—In the absence of transactions in Old Iron Rails quotations are nominally \$17.50 @ \$18. The supply is increasing, as small roads are making repairs, and consumers are anticipating an easier market in the near future on this account. The large railroads are holding their stocks very firmly and refuse to consider bids of less than \$18. It is stated that contracts for forward delivery have now been well covered, and the support given to this class of material on that account will not be felt hereafter. The strength of Old Iron Rails, in the face of a steady decline in other old material, has been phenomenal. Old Steel Rails are stagnant. Nominal quotations are \$10.75 for short pieces to \$15 for long lengths. Old Car Wheels are unchanged at \$14.50 @ \$15, according to quantity, but transactions are very light.

Scrap.—Some improvement is reported in cheap grades, but the market generally is very quiet. Dealers maintain the following selling prices per net ton: No. 1 Forge, \$14; No. 1 Mill, \$10; Sheet Iron, \$6; Pipes and Flues, \$9.50; Axles, \$21; Horseshoes, \$14; Fish Plates, \$16; Spikes and Bolts, \$13.50; Cast Borings, \$5.75; Wrought Turnings, \$7.75; Axle Turnings, \$9.50; Heavy Cast, \$11; Stove Plate, \$8.50; Malleable Cast, \$9; Mixed Steel, \$10 @ \$10.25, gross ton; Leaf Steel, \$17.75.

Metals.—Copper is lower. Carload lots of Lake are now selling at 11½¢, and Casting Brads at 10½¢. Spelter has been sold at 4.10¢ or less. Pig Lead in carload lots is quoted at 3.70¢ @ 3.75¢.

Wm. G. Stephens was appointed receiver of the Chicago Tire & Spring Company of Chicago, on May 15. The works will probably be kept in operation. No statement of assets and liabilities has yet been issued. Mr. Stephens has had previous experience in conducting these works, as he was receiver several years since during a prolonged contest for control between two sets of stockholders.

Turner, Dickinson & Co. of Chicago, general foundrymen, made application for a receiver on May 20. Although one of the smaller Chicago foundries, this establishment has acquired a good reputation for progressive management and has turned out a superior quality of work. It is expected that their difficulties will shortly be adjusted.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building, |
St. Louis. May 24, 1898.

Pig Iron.—Business continues to drag along much in the same condition as last noted. The only noticeable change is an increased amount of cheap Iron now being offered at prices which appear ridiculously low—low, so low, in fact, that consumers are timid about buying, as they say there must be something wrong with the Iron, and cannot account for the difference in price in comparison with the leading brands in any other way. The result is an unsettled market, with but little business doing. No. 2 Charcoal and No. 1 Soft

Southern Irons seem to be the principal points of attack, and prices quoted show a difference of from 50¢ to 75¢ per ton between the lowest and highest prices now being quoted. No. 2 Foundry has gained a little strength, as furnaces do not appear to be overstocked with this grade just at the moment. Locally consumption is fair, and while consumers are not buying heavily they are not carrying large stocks, and the first favorable turn prices take will doubtless find them in the market as purchasers. We quote as follows, for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$13.00	@\$13.50
Southern Coke, No. 2 Foundry.....	12.00	@ 12.25
Southern Coke, No. 3 Foundry.....	11.00	@ 11.75
Southern Gray Forge.....	11.25	@ 11.50
Southern Car Wheel.....	17.75	@ 18.25
Lake Superior Car Wheel.....	17.00	@ 17.50
Ohio Softeners	18.00	@ 17.00
Missouri Charcoal, No. 1 Foundry	18.00	@ 18.50

Bar Iron.—A fair demand is reported by both mills and jobbers, while prices remain unchanged. Mills have their order books pretty well filled, and are not making very low prices to stimulate trade. They quote 1.50¢ @ 1.52½¢, f.o.b. cars East St. Louis, according to quantity and specifications.

Barb Wire.—The demand for Barb Wire is slow and does not show any sign of immediate improvement. Prices are unchanged and straight carloads are quoted at \$2.15 for Painted, with Galvanized at \$2.55.

Wire Nails.—The trade in Wire Nails is unusually dull, and mills find their stocks accumulating at an unpleasant rate. Jobbers appear to be well supplied, and as prices appear heavy at \$1.60 for carload quantities, there is not much inducement for them to buy. Jobbers quote \$1.70 @ \$1.75 to the country trade, without, however, getting much business.

Pig Lead.—This metal is somewhat firmer at 3.65¢, with only limited offerings at this figure. There does not appear to be any large amount of unsold Lead on hand, and as the larger concerns are refusing to accept business at the above price, a moderate advance, say to 3.75¢, seems more than likely to occur. An occasional order is reported at 3.65¢, but a dozen carloads would not be bought at this figure.

Spelter.—This metal seems to be left to drift whether the tide will carry it. Two years since the market was 4.30¢, to-day offerings for delivery during the entire year are freely made at 3.90¢, with intimations that a bid of even less might secure it. A small-sized strike is in progress in the Kansas District, which may result in vivifying the market somewhat, but consumers should bear in mind that the production of this metal continues to exceed consumption, and with this condition of affairs at present prevailing any strong advance seems out of the question. The market is in an unsettled condition and the conservative course of buying from hand to mouth is recommended as a safe policy to adopt.

Charles Becker and Benhard Yoch, receivers of the Belleville Steel Company, announce to the trade that it is their intention to continue running the mills, and that all unfilled orders and any that may be placed with them will be executed promptly.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., Philadelphia, Pa., May 23, 1898.

Pig Iron.—The condition of the market is somewhat complicated, owing to the announcement of a new schedule of freights from the South. These vary from 30¢ to 70¢ per ton, and make a vast difference to the consumer. If these figures have to be actually paid it means an average advance of at least 75¢ per ton, not only in Southern Irons but in the general market, which has been largely dominated by quotations on this class of Iron. Representatives of Southern furnaces claim, however, that they will be able to reach many of the leading markets, such as Baltimore, Philadelphia, Wilmington, Trenton and other points accessible by water (by way of Mobile) at about the same cost as before. This, of course, is to some extent a matter of opinion, and in any case would not meet the requirements of buyers of 50 or 100 ton lots, owing to inconvenience of handling. But in any case it means higher cost to the majority of buyers. Those who can handle full cargoes, and who are conveniently situated for such deliveries, may not be much hurt, but to the smaller consumer and to the general market it will involve higher prices, 25¢ in some cases, 50¢ in others, and in a few instances, perhaps, 75¢ per ton. All that can be fairly claimed at present is that the market is unsettled, and that sellers ask more money. Buyers are not much disturbed in regard to the matter, they would be glad to see an upward movement; but in the meanwhile they are not buying anything that is not actually needed. So many false starts have been made within the past two or three years that they no longer respond to little incidents of this kind. If the market is going higher, they are quite willing to pay the advance, but they will not anticipate requirements. At last week's prices they would be perfectly willing to increase their lines, but sellers are not in it on those terms. The result is a stand off on both sides—holders asking more money, buyers bidding last week's rates—neither one being inclined to make concessions.

General quotations for Philadelphia and equivalent points are about as follows:

American Scotch, No. 1x.....	\$16.00	@ \$16.50
American Scotch, No. 2x.....	15.00	@ 15.50
Standard Penna. (Lake Ore), No. 1x	15.00	@ 15.50
Standard Penna. (Lake Ore), No. 2x.....	14.50	@ 14.75
Standard Virginia, No. 1x.....	14.75	@ 15.00
Standard Virginia, No. 2x.....	13.75	@ 14.25
Virginia and Southern, No. 1x Soft.....	14.25	@ 14.50
Virginia and Southern, No. 2x, Soft.....	13.50	@ 13.75
Standard Penna. and Virginia Forge	13.00	@ 13.25
Ordinary Forge.....	12.50	@ 12.75

Steel Stock.—The demand is not of much importance, but as stocks are unusually low, makers have no difficulty in getting full prices for anything they can spare. A few small lots have been taken at last week's asking prices, viz: \$15 @ \$15.25 for Standard Bessemer at furnace and \$17.25 @ \$17.50 for Low Phosphorus.

Steel Billets.—Demand light, but sellers are asking at least 50¢ per ton advance on last week's rates. Sales of Western Steel have been made at \$23.25 @ \$23.50, delivered to mills near by, but they are now quoting \$23.75 @ \$24, and apparently with a good deal of firmness. Consumers are comparatively indifferent in regard to the matter, and for the time being are not bidding with much spirit, \$23.50 being an

outside figure for medium sized lots. The tone of the market, however, is better than it was a week ago, and the indications are rather favorable to the sellers' interests.

Steel Rails.—There is no change in this department, mills running fairly full on Standard Rails, and very much pushed for Street Rails. Prices as before: \$30 at mill, and Girder Rails, \$33 @ \$35.

Muck Bars.—There is some inquiry, and at \$23 @ \$23.25 delivered a few small lots would be taken, but holders in most cases quote \$23.50 firm, and in anticipation of a brisk demand during the hot months are not inclined to make concessions.

Bars—The demand is about of the usual character, not much better, not much worse. Prices, however, are at the very lowest on record, one long established and well-located concern made sales on Saturday at the lowest figures that ever went on their books, and even that is not as low as some others are willing to sell for. It is impossible to quote prices with any exactness, but 1.60¢ @ 1.65¢ for city deliveries, and 1.55¢ at interior points seems to be about the usual asking prices on carload lots and upwards. Steel Bars, 1.60¢ @ 1.85¢, according to quality requirements.

Plates.—Market dull, but without special change in prices. Large orders are scarce, but when they are around they only tend to still further demoralize values. Two important orders recently taken by Pittsburgh mills for Eastern delivery seem to knock the market all to pieces, and manufacturers hardly know what figure to quote so as to be sure of being somewhere near what Western people are willing to accept. Small orders are fairly abundant, which keeps the local mills moderately well employed. The outlook is not encouraging, however, and for the present there is nothing in sight likely to bring much improvement. General quotations are about as follows, but on special orders liberal concessions are made.

Iron.	Steel.
Tank Plates....	1.80 @ 1.85¢
Shell.....	1.80 @ 2.20¢
Flange.....	2.70 @ 2.90¢
Fire Box.....	3.00 @ 4.00¢
Special qualities.....	3.25 @ 3.75¢

Structural Material.—There is very little new business coming on the market, and such contracts as have been closed only serve to emphasize the exceedingly weak condition of prices. Mills have a considerable amount of work in hand, and are likely to be fully employed during the summer months, but, beyond contracts actually in hand, there is nothing very encouraging in the immediate outlook. General quotations are about as follows, subject to liberal concessions on large orders: Beams, Channels, or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.80¢ @ 1.85¢; Universal Plates, 1.80¢ @ 1.90¢.

Sheets.—There is a good demand for Thin Sheets, and at the price bid mills could get all the business they are able to handle. The figures bid for large lots, however, are very much below what they ought to be, so that business is not satisfactory to manufacturers. Common qualities can be had at unprecedentedly low figures, but small lots of best makes are quoted about as follows:

Best Refined, Nos. 14 to 20....	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24....	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26....	3.15¢ @ 3.20¢

Best Refined, No. 27..... 8.80¢ @ 3.40¢
Best Refined, No. 28..... 3.40¢ @ 3.50¢
Common, $\frac{1}{4}$ ¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about $\frac{1}{4}$ ¢ lower than here named :

Best Soft Steel, Nos. 14 to 16... 2½¢ @ 2½¢
Best Soft Steel, Nos. 18 to 20... 2½¢ @ 3¢
Best Soft Steel, Nos. 21 to 24... 3½¢ @ 3½¢
Best Soft Steel, Nos. 25 to 28... 3¾¢ @ 3¾¢
Best Soft Steel, Nos. 27 to 28... 3¾¢ @ 3¾¢
Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the
above prices.

Best Bloom, Galvanized, dis. 70 and 5¢
@ 70 and 10¢

Old Material.—The demand is surprisingly small, so that any attempt to force business only leads to intimidating buyers and to a lower range of quotations. Prices are nominally as follows, but they are only obtainable for such qualities and such quantities as consumers may happen to need: Old Iron Rails, \$17.00 @ \$18, delivered; Old Street Rails, \$19 @ \$19.50; Old Steel Rails, \$15 @ \$15.50; No. 1 Railroad Scrap, \$15 @ \$16, Philadelphia, or for deliveries at mills in the interior, \$15 @ \$16, according to distance and quality; \$8 @ \$9 for clean new No. 2 Light Scrap; \$7.50 for old No. 2 Light Scrap; \$11.50 @ \$12 for Machinery Scrap; \$12 @ \$12.25 for Wrought Turnings; \$8 for Cast Borings, and nominally \$22 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

Wrought-Iron Pipe.—There is very little business at present, and while prices are not strong, there is not enough demand to make it worth while cutting. Discounts are nominally as follows :

Butt-Welded Black.....	57½%
Butt-Welded Galvanized.....	50%
Lap-Welded Black.....	67½%
Lap-Welded Galvanized.....	57½%
Boiler Tubes, 2½ inches.....	65%
Boiler Tubes, 3 inches.....	67½%

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, May 24, 1893.

The stringent money market has caused a curtailment of operations among many customers of Pig Iron, especially car works, and the purchases have been light, individually and in the aggregate, during the week. Buyers who have previously purchased liberally for forward delivery are not now anticipating their wants more than a month or so, and there is, therefore, no large buying, but there are numerous small purchases, which keep the market from absolute stagnation. The demand is mainly for No. 2 Foundry Coke Iron and Gray Forge. More would sell, but it is scarce and the sales of No. 3 Foundry are in considerable demand. The stronger Southern Iron companies are not urging their Iron on the market, but there are liberal offerings by other furnaces, so that purchasers can buy Gray Forge at \$7.75 per ton, f.o.b., Birmingham, and No. 2 Foundry at \$8.75. Of course these prices are not for single car lots. The tone of the market is anything but strong, but we hear of no lower prices even suggested, much less made.

These rates are apparently the bottom, and it is not probable that the furnaces can afford to keep up the production long. Quotations are as follows:

Foundry.

Southern Coke, No. 1	\$13.00 @ \$13.25
Southern Coke, No. 2	11.50 @ 11.75
Southern Coke, No. 3.....	11.00 @ 11.25
Ohio Soft Stone Coal, No. 1....	16.00 @ 16.25
Ohio Soft Stone Coal, No. 2....	15.00 @ 15.25
Mahoning and Shenango Valley	14.75 @ 15.00

Hanging Rock Charcoal, No. 1. 19.00 @ 19.25
Hanging Rock Charcoal, No. 2. 18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 1..... 15.50 @ 15.75
Tennessee and Alabama Charcoal, No. 2..... 14.50 @ 14.75

Forge.

Gray Forge	10.50 @ 10.75
Mottled Neutral Coke	10.25 @ 10.50
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	18.00 @ 19.00
Lake Superior Car Wheel and Malleable.....	17.75 @ 18.00

A. S. Males & Co., 15, 16 and 17 Aetna Building, have issued their catalogue No. 16 of Railway Equipment, first and second hand, including a wide variety of Locomotives, Cars and Dummies.

Boston.

Office of *The Iron Age*, 146 Franklin St., BOSTON, May 23, 1893.

The feature in the Iron market here is the amount of anticipation there is that July 1 is to see serious labor troubles at Pittsburgh and other great Iron centers. It is well understood that some of the great mills that are employing non-union men have screwed the prices of labor down below the union scale to the extent that the mills employing union men find great difficulty in competing with the product made by the mills employing non-union men. This very naturally leads the proprietors of the mills employing members of the Amalgamated Association to believe that a reduction of the scale of the association is imperative, on the expiration of the present agreement, July 1. If a cut-down in wages is attempted the union men are bound to resist and a bitter fight is feared, which may be a long one.

For this reason agents here are urging upon contractors and builders the necessity of securing contracts and the deliveries of Iron, as far as possible, previous to the beginning of these troubles. This has led to considerable trade of late, though in small orders, as mentioned below.

Pig Iron.—In Pig Iron the market is very quiet. This is not because the users of raw Iron are not busy. On the contrary, they continue very busy, but the recent financial flurry has put them into a very conservative sort of buying. But the trade will admit of no lower prices, and inquiry among buyers brings out the statement that they are buying only a very little Iron, and are bidding on still less. Quotations on Southern Iron, laid down in Boston, are: No. 1, \$15 @ \$15.50; No. 2, \$14.50 @ \$15; No. 3, \$13 @ \$14. Pennsylvania Iron is dull without change in values.

Bar Iron.—There is a quiet and a steady demand for New England Bar Iron. The machinists and other users of Bar Iron are busy, and it takes a good deal of Iron and Steel to keep them going. The Warr mill, at Wareham, did not start up on Monday, under the new lessee and manager, but it was to start on Wednesday. The mill has some orders, and will doubtless make a good run. A shortage of coal has caused the recent delay. Ordinary New England Bars are quoted at 1.60¢ @ 1.65¢ from mill; from store, 1.65¢ @ 1.70¢; best Puddled Iron bars, 1.80¢ @ 1.90¢ from mill; from store, 2¢ @ 2½¢. Norway and Swedish Irons continue quiet, with the market at \$64.50 @ \$66 per ton for Bars and Shapes.

Building Iron.—There is a stronger feeling in Iron or Steel for building

purposes, owing to the prospects for labor troubles and to the fact that Steel Billets have advanced in Pittsburgh till \$22 $\frac{1}{2}$ ton, free on board, is quoted as the market. Agents are positively urging the placing of orders and contracts before the beginning of labor troubles. There are a good number of fair-sized contracts on the market. One contract, involving some 400 tons of Struc ural Iron, was to be bid upon yesterday. Later it was reported that the contract did not go to Boston parties. Quotations are very steady at: Beams and Channels, from mill, 1.90¢ @ 2¢; from store, 2.30¢ @ 2 $\frac{1}{2}$ ¢; Tees, 2.20¢ @ 2.30¢, from mill; from store, 2.40¢ @ 2.65¢; Angles, 1.90¢ @ 2¢ from mill; from store, 2.30¢ @ 2.45¢.

Steel, Steel Plates and Steel Rails. There is a fair demand for Merchant Steel from machinists and manufacturers. The stronger position of Steel Billets, as mentioned above, is having some effect on the market. The market is steadily quoted at: Bessemer Steel, 2¢ @ 2.10¢; Tire and Sleigh Shoe, 1.95¢ @ 2¢; Sheet, 2 $\frac{1}{2}$ ¢ @ 2 $\frac{1}{2}$ ¢; American Cast, 6 $\frac{1}{2}$ ¢ @ 7¢; English Cast, 14¢ @ 15¢; American Steel Rails, \$29, at mill. The market on Steel Plates is more steady, with a rather better trade and not quite as much anxiety for orders. The quotations are very steady at: Tank, 1.85¢ @ 1.90¢; Shell, 1.95¢ @ 2¢; Refined, 2.10¢ @ 2.15¢; Flange, 2.15¢ @ 2 $\frac{1}{2}$ ¢; Fire Box, 2 $\frac{1}{2}$ ¢ @ 2 $\frac{1}{2}$ ¢.

Nails.—The request for Nails is good, with prices steady at \$1.50 @ \$1.60 for small lots, and at \$1.45 @ \$1.50 for large lots of both Iron and Steel Cut Nails. Steel Wire Nails are steadily quoted at \$1.70 @ \$1.75 $\frac{1}{2}$ ¢ per keg.

Pipe and Tubes—Trade continues good in Pipe. The dealers are busy, with orders and shipments. The recent meeting of manufacturers in New York put up the prices of butt-welded plain and tarred pipe by lowering the discounts 2 $\frac{1}{2}$ %. But the prices of tubes were lowered by increasing the discounts.

Scrap Iron.—The market on scrap is still quiet. The Warr mill people have not yet commenced buying to any extent. The forge people are taking some of the best selections of No. 1 Wrought, at full quotations. No. 1 Wrought is quoted at 52 $\frac{1}{2}$ ¢ @ 55¢ $\frac{1}{2}$ ¢ per 100 lb., with best selections at 60¢ @ 65¢. Old Horse-shoes bring 60¢ readily. Light Scrap is quoted at 35¢ @ 40¢. Machine Shop Scrap is steady at 25¢ @ 30¢ for Cast and at 30¢ @ 35¢ for Wrought.

Cleveland.

CLEVELAND, OHIO, May 22, 1893.

Iron Ore.—The market is almost featureless. The Illinois Steel Company's agents have talked with the local dealers, but buyers and sellers seem quite a little way apart. The Escanaba rate for transportation seems to have settled down to 60¢ $\frac{1}{2}$ ¢ ton, and on that basis several charters were made to day. The talk in Ore circles to-day is that good Bessemers can be had for figures very close to \$3.75 $\frac{1}{2}$ ¢ ton, f.o.b. Cleveland, just at present. It is a fact, though, that efforts are now concentrated on the work of clearing up the docks at lower lake ports, and Ore is being rushed forward to the furnaces at an unprecedented rate. Over 38,000 tons were sent on last week, as compared with 22,500 tons for the same week in 1892. The market is being closely watched by all interested therein.

There has been some buying of non-Bessemers during the past week at \$2.90 @ \$3.15, while some of the unsold Bessemer Ores on the docks have been let go as low as \$2.80, f.o.b. vessels Cleveland or other lower lake ports. Sales aggregating 500,000 or 1,000,000 tons are looked for at any moment, but just when they will occur is something that no one can anticipate. Ore is arriving in large quantities from the upper lakes.

Muck Bars.—The demand is said to be better, and \$24 $\frac{1}{2}$ ¢ ton is given out as a steady quotation, Cleveland delivery.

Structural Material.—Business is better, but still below the expectations of manufacturers. Prices are unchanged, although the demand is much better.

Pig Iron.—Although the market is firmer, but few sales are reported here. Local dealers announce \$13.50 @ \$13.65 as existing quotations for Bessemers. The improvement does not seem to extend to Gray Forge, which continues rather weak at \$12.15 @ \$12.20, and with these quotations somewhat uncertain. Foundry Irons continue in fair demand at \$13.75 @ \$14 for No. 1; \$12.75 @ \$13 for No. 2, and \$12 for No. 3. Business is rather slack despite the improvement in prices.

Scrap.—The market continues weak, with No. 1 Railroad Wrought in slight demand at \$12 @ \$12.50. Wrought-Iron Turnings are now quoted at \$6.50.

Old Rails.—An occasional sale of Old Americans at \$19 is reported. The demand, however, is light.

Nails.—Wire Nails at \$1.50 $\frac{1}{2}$ ¢ per keg and Steel Wire at \$1.15 $\frac{1}{2}$ ¢ per keg are car-load quotations. From stock dealers quote the former at \$1.65 and the latter at \$1.40 $\frac{1}{2}$ ¢ per keg, with the probability of these prices being shaded to help along an order.

(By Telegraph.)

The outlook is now regarded as good for some substantial sales within the next few days. The Iron market is considerably firmer. Bessemer Ores are being offered at \$3.75 $\frac{1}{2}$ ¢ ton, Cleveland, and it seems probable that buyers will soon see their way clear to pay substantially this amount. The Escanaba rate is now 55¢, and the Ashland rate, \$1. Ore is coming down at a rapid pace. The old non-Bessemer Ores on the dock are being sold at about \$2.80, and are being well cleared up. An Ore dealer reports to-day sales of 10,000 tons of good Bessemer at \$3.75, Cleveland. The same Ore sold last year at \$4.25. The Scrap Iron market was never duller. A small sale of Old American Rails is reported at \$19.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, May 23, 1893.

The situation presents a few encouraging features this week, and it is the impression that between now and July 1 we will have considerable activity among the mills, with a probability of higher values for some lines of goods. The advances in Bessemer Pig and Steel referred to last week have been sustained and the tendency of the market is in

the direction of still higher prices for both materials. Makers of Structural Material are being favored with increased business, the very low prices ruling having stimulated buying to considerable extent. In Plates, Pittsburgh has gone in and captured business in distant localities by naming prices which have taken away the breath of competitors. In this department of trade Pittsburgh undoubtedly has a tremendous advantage, both in point of equipment of plants and in wages paid. In Wire Rods, Wire and Wire Nails, there is only a fair business with prices stationary. Pipe and Tube makers are having a busy season and a strong effort is being made to adhere closely to established discounts. Bars are in better demand, and buyers are hurrying in orders for shipment before July 1 in anticipation of trouble over the wage scales. Already several of our largest concerns are absolutely refusing to book any orders for delivery after July 1, as they say the time has come when the Amalgamated Association must grant them concessions in wages that will put them on a more equal footing with competitors. If this is not done, they will follow the course of other firms and operate their mills with non-union men. From the Mahoning and Shenango Valleys comes the report that unless material reductions in the wage scale for 1893-94 are offered by the Amalgamated Association a strike will take place. To offset this, certain persons claiming to be well informed, say that a scale based on \$5 $\frac{1}{2}$ ¢ ton, with proportionate reductions in other departments, will be offered the manufacturers. There is considerable uneasiness over the situation, and the hope is expressed everywhere that the labor organizations, with a full knowledge of the extremities surrounding the Iron and Steel trades, will offer such concessions as existing conditions demand and justify.

Bars.—As showing the trend of affairs in this department, we can state that several makers are refusing to book orders for delivery after July 1, and at the same time are operating their mills to full capacity in order to have as much stock as possible. As would be expected, buyers are getting a little uneasy and are hurrying in orders without waiting to sound the market thoroughly for lowest prices. Makers are not disposed to shade prices as they did some time ago, and when they name a price buyers understand that they must pay it or do without the goods. These conditions have naturally made prices firmer, and we now quote Steel Bars at 1.52 $\frac{1}{2}$ ¢ @ 1.60¢, half extras, at mill. In the Mahoning Valley Bars are held at 1.45¢, half extras, at mill, with 1.42 $\frac{1}{2}$ ¢ for desirable specifications.

Ferromanganese.—A slightly better inquiry is reported in the past week, and prices have shown a firmer tendency. We now quote at \$58.25 @ \$58.50, with the sale of 50 tons reported at the first-named price.

Structural Material.—While the situation, as far as demand and prices are concerned, is not satisfactory, we are advised that so far this month business has shown considerable improvement over the corresponding period in April. It is the impression that from now until the end of the building season there will be considerable business, although the tonnage will not be as large as expected. A number of large buildings that would have been erected this year had the money market been better have gone over until next year, which, of course,

makes a hole in the demand. Prices are not any firmer, and, in fact, have shown little change for the past two or three weeks. We quote as follows: Beams and Channels, 1.60¢ @ 1.70¢, according to order; Tees, 1.80¢ @ 1.90¢; Angles and Universal Plates, 1.60¢ @ 1.70¢, and Z Bars, 1.70¢ @ 1.80¢.

Wire Rods.—A prominent maker of Wire Rods advises us that there are a number of inquiries in the market, but as yet these have not resulted in much actual business. The inquiry of 2000 tons noted last week as being in the market has not as yet been closed. We are also advised of another inquiry for 1000 tons, which will probably be closed up this week. The stocks of Wire Rods are believed to be small and with the firmer tendency in Steel it is the impression that prices are about as low as they will go. We quote the market at \$29.50, Pittsburgh, but it is possible a very desirable order, with satisfactory terms of payment to makers, would shade this price about 50¢.

Steel Rails.—The situation is quiet, and while a very fair tonnage is going, it is nearly altogether for small lots. The Edgar Thomson mill has been on Rails for quite a period and is turning out close to 1500 tons a day. We quote the market at \$29 for Standard sections, f.o.b. cars Pittsburgh. As stated last week, some extremely low prices are being named for small sections.

Plates.—Several prominent makers in this city are understood to have captured considerable business during the past three or four weeks, but were compelled to name, in a good many cases, very close prices. Now that their order books are in pretty fair shape any further demoralization in prices may be prevented. The facilities enjoyed by two or three concerns here for turning out Plates at a very low cost are unsurpassed, and allow these concerns to enter other markets and undersell concerns located much closer to point of consumption. We quote as follows: Tank, 1.60¢ @ 1.65¢; Flange, 1.85¢ @ 1.95¢; Ordinary Fire Box, 2.20¢ @ 2.50¢; Special, 3¢ @ 3.50¢; Shell, 1.80¢ @ 1.90¢.

Muck Bars.—A slightly better inquiry is reported and it is believed that demand from now until July 1 will show considerable improvement. Prices have shown no material change and we continue to quote No. 1 Muck Bars at \$24, delivered at buyers' mill. This price continues to be shaded for very desirable orders.

Wire and Cut Nails.—When the fact is considered that the large buyers are out of the market, and also that prices are not firm enough to induce concerns to anticipate their requirements to any extent, the demand for Wire Nails is fairly satisfactory. The demand for the season of 1893 will go on record as being the heaviest in the history of the trade, and with the very favorable prices ruling for Steel, it is probable that the year's business will show a balance on the right side. The fact that Steel has already shown an advance, and may go higher, will undoubtedly have a very material effect in strengthening prices for Wire Nails. We quote the market at \$1.45 in carload lots, Pittsburgh or Cleveland, and \$1.50 in less quantities. There continues to be a fair demand for Cut Nails, with no improvement in prices. Mills in the Wheeling district are well fixed with

business and continue to make large shipments, of their product by Ohio River to lower points. We quote Cut Nails at \$1.10 base in Wheeling district.

Pipes and Tubes.—One of the best departments of the Iron and Steel trade at this time is Pipes and Tubes, for which there is a very good demand, with prices as adopted recently reported as being very closely observed. An inquiry is in the market for a large amount of Line Pipe for shipment South which Pittsburgh makers expect to capture. Discounts are ruling as follows: Butt-Welded Black Pipe, 57½% from manufacturers' list. Discounts on other sizes and kinds are as follows: Butt-Weld Galvanized, 50%; Lap-Weld Black, 67½%; Lap-Weld Galvanized, 57½%. On Boiler Tubes discounts are as follows: 2½ inch and smaller, 65%; 3-inch and larger, 67½%.

Sheets.—As noted last week, makers of Sheets both here and in the Wheeling district report a very active demand, with a number of concerns having their product sold up very largely for the next two or three months. Prices are firm, with tendency to higher values, and should labor complications arise on July 1, still higher prices will no doubt prevail. We continue to quote Common Sheets as follows: No. 24, 2.50¢ @ 2.60¢; No. 26, 2.65¢ @ 2.70¢; No. 27, 2.75¢ @ 2.80¢. On Soft Steel Sheets an advance of from \$1 to \$2 a ton on above prices is charged. For Galvanized Sheets the demand is also very heavy, and mills are pushed to their utmost in order to turn out product as fast as wanted. Prices continue firm, with slightly higher values probable in the near future. We quote best Bloom at 70 and 5% for ordinary lots and 70 and 10% for desirable business.

Wire.—That we are getting well on toward the close of the season is indicated by the fact that mills have about caught up with deliveries, and also by the fact that new business is coming in very slowly and for small lots. Prices, however, are fairly strong and we continue to quote Painted Barb Wire at 2.05¢ in carload lots and Galvanized at 2.45¢. Plain Wire is in only moderate demand. We have reduced prices slightly and now quote as follows: Nos. 6 to 9, 1.65¢; Nos. 10 and 11, 1.75¢ @ 1.90¢. For desirable orders these prices would be shaded to some extent.

Merchant Steel.—Business continues light and mills are feeling the market more energetically for buyers than is usual at this season of the year. Season contracts are being held back, and large buyers are being offered attractive prices in order to put them in a mood for opening negotiations. We quote Open-Hearth Machinery at 1.85¢ @ 2¢ and Spring at 2¢ @ 2.10¢; Tool Steel is ruling at 5½¢ and upward, according to quality.

Connellsville Coke.—The Coke trade continues disappointing, the production still keeping ahead of the demand. For the week ending May 13 there were 11,592 ovens in the Connellsville region in blast and 5735 idle, with a total estimated production for the week of 112,997 tons. Prices for Furnace Coke continue to rule at \$1.60 @ \$1.70 in tons of 2000 lb, f.o.b. cars in Connellsville region. Foundry Coke is unchanged, at \$2.15 to dealers and \$2.30 to consumers.

Freights.—On June 1 freights to Texas common points from Pittsburgh territory on Nails and Wire will be advanced to 62¢ a 100 lb; on bottles, window glass and fruit jars the rates will be advanced to figures in effect prior to the recent reduction. On Bar, Band, Boiler and Plate Iron and Iron Roofing in carload lots, the rates will be reduced to 65¢ a 100 lb.

(By Telegraph, May 24, 12.25 p.m.)

Pig Iron.—For the week under review the market on Bessemer Pig has been fairly active, and the recent advance in price has been sustained. Furnaces in the Pittsburgh district are well sold up for the next month or two, and the same is largely true of the Mahoning Valley. There is no pressure on the part of furnaces to dispose of their output, and with a fair inquiry for Iron for close delivery, prices are firm, with a tendency to higher values. While it is true that the Pittsburgh district is making more Iron than ever before in its history, it is also true that only a comparatively small part of it finds its way into the open market. During March and April a local interest turned out close to 175,000 tons of Iron, and yet this same concern is credited with having purchased large blocks of Bessemer recently, much of it for delivery after July 1. The demand for Gray Forge continues fair with prices unchanged. We quote as follows:

Neutral Gray Forge.....	\$12.15	@	\$12.25, cash.
A.O.-Ore Mill	12.50	@	"
No. 1 Foundry	13.75	@	14.00.
No. 2 Foundry	12.75	@	13.00.
Charcoal Foundry No. 1	17.00	@	18.00.
Charcoal Foundry No. 2	16.50	@	17.00.
Bessemer Pig	13.50	@	13.70.

We note a sale of 3000 tons of Bessemer for June and July delivery at \$13.60, Pittsburgh, and two sales aggregating 3500 tons at \$13.65, Pittsburgh, and 500 tons for above delivery at \$13.70, Pittsburgh.

Billets.—The fact that at least two Steel plants in the Pittsburgh district and three in the Wheeling district will close down during June for repairs has added considerable strength to the market and during the past week prices showed further slight advances. The situation clearly shows that the advantages have shifted around to the side of the makers, and, with very little Steel for sale between now and July 1, either by Pittsburgh or Wheeling, coupled with an active buying movement, has resulted in an advance of fully 75¢ a ton over the lowest prices at which Steel sold early in the month. We are advised of a sale of 1000 tons of Nail Billets at \$22 at maker's mill; also 1500 tons of Billets at \$21.90 at maker's mill; also 1500 tons of Billets at \$21.90 at maker's mill; 1000 tons at \$22.25, delivered, the Steel netting the maker about \$22.15. Indications point to these higher prices being maintained, while still higher prices for prompt Steel are probable within the next four or five weeks.

Metal Market.

Pig Tin.—Heavy importations, further additions to the surplus stock here, practical elimination of "short" interest in the speculative arena and extreme caution on the part of investors, along with some minor influences, have brought about a further sharp decline in prices. A week ago market prices were about 19.85¢ for May, 19.95¢ for June and 20.10¢ for July delivery. Those prices looked low at that time, particularly when compared with the figures prevalent at the time that the McKinley "boom" was at its height, but the events of the past week have put a different complexion upon affairs, chiefly through showing that rock bottom was not reached when the price went to 19½¢ or about 2¢ $\frac{1}{2}$ lb below recorded market value one year ago. In other words, it seems as though overtrading and miscalculated manipulation has led to the inevitable and brought affairs into shape that shrouds the future in more than usual uncertainty. During the week under review, prices have dropped fully 1¢ $\frac{1}{2}$ lb, or to the basis of 19.32½¢ @ 19.35¢ net cash for prompt and near future deliveries, with little speculative buying, except to cover "short" sales put out some time ago. On Wednesday's market very little was done, but that little reflected a soft market, with sellers at 19.30¢ net cash for prompt delivery. No less than 850 tons have arrived here the past week, making a total of 3480 received since the beginning of the month, and adding over 2200 tons to the accumulation on this side of the Atlantic during the interval. There are afloat about 1400 tons, nearly all of which is due shortly, and the probabilities are that the accumulation by July 1 will be equivalent to five months' consumption. Between the statistical position, present low prices and the uncertainties as to the future of the McKinley duty, the market is an extremely hazardous one for speculative ventures.

Copper.—Business has been moderate, demand has dropped off somewhat as well, and the offering has reflected no change in the attitude of sellers. In short, the market has been a decidedly quiet one and entirely bare of new features, apart from rumors to the effect that some Lake Superior and Arizona producers are preparing to increase their output beyond the proportions reached last month. Prices have not suffered to any marked extent, but the market has a rather soft appearance at this writing. There are sellers of Lake Superior Ingots at 11¢, Electrolytic at 10½¢ @ 10¾¢ and Common Casting Copper at 10¢ @ 10¼¢, for delivery three to six months ahead. Spot stock, in wholesale quantities could have been secured at about the same prices.

Pig Lead.—Early in the week a few parcels of common domestic were picked up at 3.80¢ @ 3.82½¢. Subsequently about 300 tons were placed at 3.85¢. The entire business makes an indifferent showing, however, and the apparent turn for the better in tone of the market would appear to be due more to lighter offering than to scope of buying or demand. In other words, the market is a very narrow one and devoid of new feature from which either buyer or seller can claim any decided advantage.

Spelter.—The offering of Western brands at 4½¢ for delivery during the next six months has been freer and ru-

mor had it that some business was put through at a shade below that price. As far as could be learned the quantity of Metal involved was moderate, however, and the demand at present is extremely tame, leaving the market in quite as unenviable shape as it was a week ago and suffering under the weight of excessive production.

Antimony.—About the usual business in small parcels has been effected. Otherwise the market remains very quiet, with little change in prices. Current quotations are 9.90¢ @ 10¢ for Hallett's, 10½¢ @ 10¾¢ for L.X., and 10½¢ for Cookson's, in wholesale lots.

Tin Plates.—Business has not improved. Spot goods have moved out in rather small quantities only and futures, drawing the line at some few specialties that are mostly bought direct by large consumers, have received little attention. Prices have been quite well maintained, however, remarkably so considering the full supply and sluggish condition of the market. Spot quotations are as follows: Coke Tins—Fenlan grade, IC, 14 x 20, scarce; J. B. grade, do., \$5.50; Bessemer full weight, \$5.50; light weights, \$5.10 @ \$5.12½ for 100 lb, \$5 for 95 lb, \$4.90 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.85. Charcoals—Melyn grade, IC, \$6.50; Crosses, \$8; Allaway grade, IC, \$5.70; Crosses, \$6.90; Grange grade, IC, \$5.80; Crosses, \$7. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.25; do., 20 x 28, \$14.50; Dean grade, 14 x 20, \$5.35 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.70; D. R. D. grade, 14 x 20, \$5.; do., 20 x 28, \$10.30; Wasters—S. T. P. grade, 14 x 20, \$4.87½; do., 20 x 28, \$9.25; Abercarne grade, 14 x 20, \$4.87½; do., 20 x 28, \$9.20.

Coal Market.

The Anthracite Coal trade is quickened into temporary activity by the question of an advance in prices June 1, many consumers providing for present wants, or at least holding themselves in readiness to buy should an advance be determined upon. Whatever the result, an advance is practically realized by operators in some instances. The Lehigh Valley, for example, will not sell at the prices quoted a week ago. Pea and Buckwheat are in better supply and easier; Pea at \$2.60, f.o.b., and Buckwheat about \$2; Egg and Broken, \$3.90. The fact appears to be that while the companies all around have been shading the schedule for Stove, which is \$4.15 $\frac{1}{2}$ ton, the disposition now is to stand out for full prices, and if the advance, as predicted by some, will be only "on paper," it will at least peg up prices to the old circular. At the same time, some of the companies have coal on hand which may be dumped on the market if nothing better can be done.

Bituminous Coal is firmer, especially Clearfield. Cumberland is about \$3.10, f.o.b., and Clearfield averages \$2.85. The question of railroad tolls causes some irregularity, as they are considered too high, and relief in this respect is hoped for.

Anthracite production for the week 757,800 tons, a decrease of 58,000 tons compared with the same week last year, but since January 1 there is an increase of over 1,000,000 tons. The Pennsylvania Railroad reports 278,000 tons,

and the Reading 445,000 tons, of which 62,000 tons were shipped to New York waters.

The anti-combine Coal convention, to be held in Chicago June 5 and 6, will be attended by delegates from 26 States.

Financial.

The financial situation, viewed from the bankers' standpoint, has undergone no variable change during the week, while the mercantile classes are further admonished that the times are badly out of joint. The "crush of the industrials" is a feature that only rivals in mischievous effects the collapse of the Zimri methods of banking. Closely following in the wake of the Cordage trust is the voluntary dissolution of the sewing machine trust and the reported withdrawal of prominent distillers from the whisky trust, threatening still another disaster, unless, as has been intimated, the reports in circulation are "a whisky trick." Closely connected is the suspension of the Bank of Deposit in New York, which had only a precarious existence, and for substantial reasons was unable to obtain admission into the Clearing House. In their exemption from trouble the associated banks find a complete vindication of their course within conservative lines. They now find themselves strongly entrenched behind their gathered resources, in anticipation of coming events. Local financial institutions stand unshaken. Related more particularly to railroad management, credit received a severe shock from the disclosures of the accountant who examined McLeod's control of Reading's finances and sees fit to condemn the exercise of the power by a president "to privately draw securities from the treasury of the company against his simple receipt, to use them as margin on stock speculations and to involve the company in liabilities to an unlimited extent by reason of these speculations."

The question arises, are such methods to be condoned with impunity? Importing merchants are more directly concerned in the custom house examinations just commenced under the direction of ex-Secretary Fairchild, with reference to alleged undervaluations and other irregularities. California trade by way of Panama is exercised by the supposed arrangement of railroad and steamship troubles through the intervention of C. P. Huntington, who purchased the five steamers of the bankrupt Brazilian Mail Company, and who may now be in a position to raise rates of freight to the transcontinental level. Mr. Huntington denies that there is any war of rates between the Southern Pacific and Canadian Pacific Railroad companies.

On Monday news of the suspension of the Elmira National Bank, due to the embarrassments of Col. D. C. Robinson, made the market a little irregular, but the declines were only fractional. The stock market was unsettled by numerous failures, principally in the West, especially that of the Northwestern Guarantee & Loan Company, with \$5,000,000 reported liabilities, though others of local importance, like that of the Archer & Pancoast Company, contributed to the uneasy feeling. Cordage was influenced by the selection of a committee to prepare a plan of reorganization, and the Western railroad stocks felt the effect of the improvement in the railroad situation. Whisky was unfavorably affected by news of

the institution of proceedings against the company by the Attorney-General of Illinois, who makes strong charges against the trust, declaring that it is an illegal organization under the Illinois State laws. The cables showed a firm feeling for open market discounts in London, indicating a further advance in the Bank of England rate next week. The buying of Pacific Mail was caused by a report that the negotiations for the settlement of the troubles between this company and the Panama Railroad Company have been satisfactorily concluded. Northern Pacific preferred rose on the announcement of the perfection of the collateral trust scheme. On Monday the market was very dull.

United States bonds are quoted as follows:

U. S. 4½%, 1891, extended	99
U. S. 4%, 1897, registered.....	112½
U. S. 4%, 1907, coupon.....	112½
U. S. currency 8s.	105

The money market is easy for call loans and time money is in good supply, but lenders stipulate for such conditions that little business is done. The rate for all dates is still 6 %. Commercial paper is very quiet. The rates continue 6½ @ 8 % for the best names, and as high as 10 % for others not so well known. Banks limit their discounts to the accommodation of customers, but more liberal terms are looked for. The bank return showed a gain of \$7,581,500 in cash and of \$6,627,150 in surplus reserve, making this item \$24,422,175. Exchange was firm during the week, influenced by dearer discounts in London and by an advance in the Bank of England rate to 4 %. The strongest were eight sterling and cable transfers. Exports of gold for the week were \$4,000,000. The foreign exchange market was steady at about last week's quotations. The posted rates were \$4.85½ @ \$4.90.

General trade in most lines is disappointing. The prices of grain and breadstuffs have declined, wheat about 2¢ a bushel. Pork products are firm, but prices restrict business. At Chicago wheat was about the lowest for 30 years. Raw sugar, since the recent break, is advancing. Cotton 1½¢ lower and quiet.

Our foreign trade in April shows an adverse balance of \$24,000,000, exclusive of specie.

In April of last year, with only \$8,000,000 loss in specie, the balance of trade was \$7,638,184 in favor of this country. In April of this year, with a loss of nearly \$20,000,000 in specie, the balance of trade is \$4,613,556 against this country. For the ten months ending with April, 1893, the balance of trade was over \$200,000,000 in favor of this country, while for the last ten months it is less than \$13,000,000, notwithstanding the shipment of \$122,703,-824 in specie.

A somewhat curious hitch has taken place in the efforts to consolidate the Western and Southern cast-iron pipe works. It will be remembered that some time since repeated announcements were made to the effect that the leading concerns west of the Alleghenies and south of the Potomac had made arrangements to form one company. We understand that every one of the plants in question submitted sworn reports concerning earnings. The story goes that one of the companies included in the statement of earnings about \$100,000 expended on repairs and equipment. This created a good deal of dissatisfaction among the other works and may lead to trouble. It is reported that the sums to be contributed

by outside capital to the new company have been deposited in bank in New York for some time past, and that it requires only a straightening out of the hitch alluded to to bring about the consolidation which all of the parties interested are supposed to desire so eagerly.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, May 24, 1893.

Pig Iron.—Southern lines announce that the rail and water rates to Baltimore, Boston, New York, Philadelphia and Providence are not affected by the advance in arbitraries on Pig Iron north of Hagerstown, Md., and Alexandria, Va. The advanced rates, which will be issued at an early date, will, of course, affect chiefly interior points in Central and Eastern Pennsylvania, and even indirectly will not materially influence the markets tributary to New York, except possibly to increase the pressure by a part of the amount of Pig Iron crowded out of the district affected. We quote Northern brands at \$14.50 @ \$15.25 for No. 1; \$13.75 @ \$14.50 for No. 2; \$12.25 @ \$12.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14 @ \$14.50 for No. 1; \$12.75 @ \$13.50 for No. 2, and \$13 @ \$13.50 for No. 1 Soft; \$11.75 @ \$12.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—The market is dull, with very little inquiry. Quotations remain nominally as follows: \$22 @ \$22.50 for 10 % and \$25 @ \$25.50 for 20 % Spiegeleisen, and \$57 @ \$57.50 for foreign 80 % Ferromanganese.

Billets and Rods—The market is very dull. We quote, nominally, domestic Billets, tidewater, \$23.75 @ \$24.25; foreign, nominally, \$29 @ \$29.25; domestic Wire Rods, \$33 @ \$34; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$52 @ \$53.

Steel Rails—The market is exceedingly dull, no sales of any consequence having been closed by Eastern mills. So far as present prospects go, the Eastern Rail mills will not have enough work for the second half of the current year to keep them busy single turn.

Track Material.—Spikes are quoted at 1.85¢ @ 1.95¢; Fish Plates at 1.50¢ @ 1.60¢; Track Bolts, square nuts, at 2.4¢ @ 2.50¢, and hexagon nuts at 2.5¢ @ 2.60¢, delivered.

Manufactured Iron and Steel.—During the week there have been placed contracts for a large hotel at Forty-fourth street and for the reconstruction of the Opera House, while the Structural work for a new barrel factory in Brooklyn was also placed. A moderate amount of work is being figured on, but competition for the material is exceedingly keen. The anxiety to secure work on the part of some of the Western Structural mills is supposed to be due partly to a disappointingly small business in Chicago and other Western cities. In Plates a Pittsburgh mill has been given about one quarter of the material required for the Park avenue improvement. The balance still remains to be placed. The staggering price at which the 1000-ton order of Flange Steel was taken in Philadelphia last week remains a leading topic of comment. We quote: Beams up to 15-inch, 1.80¢ @ 2.10¢; 20-inch, 2.10¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.80¢ @ 1.90¢; Tees, 1.90¢ @ 2¢; Channels, 1.85¢ @ 2¢, on dock. Steel

Plates are 1.70¢ @ 1.90¢ for Tank; 1.95¢ @ 2.10¢ for Shell; 2.10¢ @ 2.25¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.60¢ @ 1.9¢, on dock, and Common 1.50¢ @ 1.60¢. Soft Steel Bars are 1.50¢ @ 1.6¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.85¢ @ 2¢, and Links and Pins, 1.85¢ @ 2.10¢; Steel Hoops, 1.80¢ @ 1.90¢, delivered; Cotton Ties, 80¢ @ 85¢ per bundle, at mill.

Old Material.—We quote: Old Iron Rails, \$16.25 @ \$16.50, on cars Jersey City, and Old Wheels, \$12.75 @ \$13.

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, May 24, 1893.

The Pig Tin market has been irregular and unsettled. Financial disturbances caused realizations on the part of small holders that led to a break in prices, in the absence of supporting orders, during the early portion of the week. Later on prices improved somewhat under the influence of more reassuring financial advices, but subsequently became weak in the absence of evidence of support from leading operators. Outsiders are doing nothing at present, considering ventures extremely risky at the present time. Sales were made on Tuesday at as low as £88. 2/6—a decline of £2. 10/ for the week—and three months' futures were offered down to £85. On Wednesday there was a further drop to £88. 7/6 and £85. 5/ respectively.

There has been some improvement in tone of the market for Copper, brought about by improvement in the European statistical position and temporary change for better in the general financial situation. Uncertainty regarding future supplies from the United States operates against free buying, however, and speculative interest is very indifferent. Latest sales of Merchant Bars were at £43. 5/ for prompt and £43. 17/6 for three months' futures. Best selected English quoted at £48. 5/.

The Tin-Plate market has been flat. American buyers are extremely cautious and their purchases have been confined chiefly to retail lots. Fair orders were placed early in the week for Oil sizes, but buyers have since withdrawn except at a reduction of about 2 pence from the prices previously paid. There is rather more inquiry for Terne. The Jersey Tin Plate Works have restarted. In the Liverpool market f. o. b. prices are as follows:

1C Charcoal, Alloway grade.....	13.6 @ 14/
1C Bessemer Steel, Coke finish.....	12/0 @ 12/3
1C Siemens " "	12/3 @ 12/6
1C Coke, E. V. grade 14 x 20	12/0 @ 12/6
Charcoal Terne, Dean grade.....	13.6 @ 14/

Pig Lead prices have remained almost stationary at £9. 10/ for Soft Spanish, and the market is still devoid of animation.

Spelter has undergone hardly any change, seller's prices being about £17. 12/6 for ordinary Silesian, while the demand is still moderate.

Pig Iron warrants have turned somewhat for the better, Scotch moving up to 40/6, Cleveland to 33/9 @ 33/10 $\frac{1}{2}$, and Hematites to 44/7 $\frac{1}{2}$. In Maker's Iron business has been moderate and chiefly at the former range of prices.

PERSONAL.

H. A. Brustlein, the general manager of the famous Unieux Steel Works in France, who has been for some time at Midvale, has returned.

Austin Gorham of New York has severed his connection with the Trenton Iron Company, and Cooper, Hewitt & Co.

Thomas A. Shoemaker has become the general manager of the Bellefonte Furnace Company, Bellefonte, Pa.

H. C. Frick has returned to Pittsburgh.

S. Watson of the Watson Machine Company, Paterson, N. J., has gone abroad.

The new board of directors of the Chateaugay Ore & Iron Company of Chateaugay, N. Y., have appointed James N. Stover general manager of the company's works, including the iron mines and forges at Lyon Mountain and Standish and the Chateaugay Railway, vice Alvin L. Inman, resigned. He also succeeds Mr. Inman in the management of the Crown Point, N. Y., Iron Company's mines, furnaces and railway. The new manager comes from the Hudson River Ore & Iron Company.

Wm. H. Conner, for 25 years foreman of the foundry department of Mackintosh, Hemphill & Co., at Pittsburgh, has resigned his position with that firm to take charge of a new foundry now being erected at Bessemer, Pa.

H. L. Collins, son of H. E. Collins, the well known iron and steel broker of Pittsburgh, has been nominated for a cadetship at Annapolis Academy.

The announcement that the brass consolidation has been perfected is somewhat premature. Thus far some preliminary work has been done by a committee on inventory and plants, and an attempt has been made to obtain a charter. It is probably the latter step which has led to the statement that a so-called trust had been formed. As a matter of fact the proposed company, the American Brass Company of Waterbury, will be a consolidation of the following concerns: The Benedict & Burnham Mfg. Company, the Plume & Atwood Mfg. Company, the Scovill Mfg. Company, the Holmes, Booth & Haydens Mfg. Company, the Waterbury Brass Company, and the Coe Brass Company of Torrington. Among the incorporators named in the act are David S. Plume, Lewis J. Atwood, Edward L. Frisbie, Jr., Edward C. Lewis, James S. Elton, Edward D. Steele, Chauncey P. Goss, Frederick J. Kingsbury, all of Waterbury; Thomas B. Kent and T. Brownell Burnham of New York City; Senator Charles F. Brooker and Edward T. Coe of Torrington.

A test of steel wire nets designed to shield naval vessels from the approach of a torpedo will be made soon. Two nets made in Pennsylvania will be put in competition with one of foreign manufacture.

Trade Publications.

WE HAVE RECEIVED from the Philadelphia Engineering Works, Limited, of Philadelphia, what they believe to be the first comprehensive blast furnace catalogue that has ever been offered to the public. The frontispiece illustrates the works of the Tennessee Coal, Iron & Railroad Company, which were engineered and started by the present chairman of this company. This is followed with general views of the different important portions of a blast furnace, and then commence views of the Gordon-Whitwell-Cowper stoves, with details of the valves, carefully showing the manner of construction. These valves are the result of many years of experience, wherein from time to time the older forms have been replaced by what has proved more satisfactory, and, although the task upon these works has been greatly increased to meet the enormous outputs to which blast furnaces have so rapidly attained, yet today there is much less difficulty with fire-brick stoves than formerly. These stoves can be maintained in constant efficient condition from the beginning to the end of the blast. After a description of the stoves there are shown the different types of blowing engines, except the last introduced, which is a horizontal, cross-compound and simple condensing engine.

These views show the variable as well as the automatic cut-off engines for moderate and high speed pressures, together with one of the Duplex form which has been successfully applied to charcoal practice, and which is recommended in compounding blowing engines. Following this are the details of these blowing engines. Then is given the feed water heater, which has special features, principal among which is the rapidity by which it can be cleaned while the engine is in operation.

Iron and steel plate chimneys, which are now being widely introduced, are next described. After the description of the charging barrows usually used at blast furnaces, and of a patented cinder car which can be tipped either sideways or fore and aft of the railroad, appear the details of the blast furnace proper. Then follows a series of tables selected and arranged to facilitate calculations frequently required by the advanced blast furnacemen. Following these is a series of rules by which the relative value of a fuel, a limestone or an ore may be determined by determining the cost of the product when using variously selected substances. These rules have been verified by actual practice. Then follow various views of Corliss steam engines, of the simple non-condensing and condensing types, and the compounds both tandem and cross, and vertical, together with the air pump and condenser, built by this company. In the last part of the book are sheets printed and ruled for conveniently entering the compositions of the various materials which a blast furnaceman may have analysis of, so that within the book he has the composition of his materials, handy rules for the utilization of this information and tables to which he can refer to aid him in these calculations and then the appliances and appurtenances which he is most likely to require from time to time in his working, running repairs, general repairs and general construction.

G. A. CROSBY & Co., 176 and 178 South Clinton street, Chicago, have just issued a fine catalogue of presses, dies and special machinery, particularly adapted to the use of canners and packers. This catalogue comprises 48 pages of illustrations and descriptive matter, but the firm state that the list of machinery and appliances given comprises only a small portion of their regular line of manufactures. They have confined the publication to such goods as they consider of special interest to canners and packers who are manufacturing their own packages or contemplating doing so. The machinery covered comprises power presses, lever presses, foot squaring shears, power and hand forming rolls, double headed and upright power crimpers, adjustable bar folders, soldering frames and cylinders, solder holds, rotary solder kettles, solder melting kettles, patent foot forming machines, foot and power squeezers, gang soldering machines, capping machines, capping irons and steels, Star patent coppers, Merriam's patent floating or soldering machines, gasoline and air tanks, power and

hand air pumps, fire pots and gasoline burners, &c. They also handle Clark's kerosene oil heater, for use in heating soldering irons in large factories, the system of using which is fully illustrated and described. Special attention is paid to fruit-can factory outfits. The other lines of machinery manufactured by the company are treated in another catalogue, a new edition of which is now in preparation.

THE BUFFALO, N. Y., FORGE COMPANY have issued a catalogue of 286 pages descriptive of their hot-blast steam heating apparatus and the fans, blowers, steam engines, drills, forges, &c., made by them. Their hot blast system of heating and ventilating is described by reference to buildings of diversified characters, drawings and perspective views being freely used to show the general arrangement in each case. These examples include public, private and office buildings, depots, theaters, hospitals, public schools, factories, &c.

WE HAVE RECEIVED from the Gisholt Machine Company of Madison, Wis., a pamphlet illustrating some work done on their turret lathe, which was fully described in *The Iron Age* of December 22, 1892. As an illustration of what this lathe is capable of we may mention that it finished in 3 $\frac{1}{2}$ hours a three-step cone pulley, having the following dimensions:

	Inch.
Large step.....	24
Middle step.....	18
Small step	12
Width of face	6 $\frac{1}{2}$
Bore	5 $\frac{1}{4}$
Hub	8 $\frac{1}{4}$
Length over all.....	23
Inside diameter, large step.....	23 $\frac{1}{4}$
Other examples are given of work done with equal rapidity and with perfect accuracy.	

THE CHAMPION BLOWER & FORGE COMPANY of Lancaster, Pa., have just published an illustrated catalogue of their forges, blowers, drills, tire benders, shrinkers, &c. They state that from September 1, 1884, to January 1, 1892, they sold 46,000 of these tools.

C. W. ARNY & SON of 228 North Third street are sending out a catalogue descriptive of their leather belting, hose and hose fittings, packings, &c. The catalogue contains a good deal of valuable information regarding the selection of stock best suited for the manufacture of belting, and illustrates the method employed by the firm in cutting. The catalogue is neatly covered in stiff paper, having the appearance of new leather.

The reduction works which the International Nickel Company, a Chicago corporation, are erecting at the nickel mines near Riddles, on the Southern Pacific Railroad, in Douglas County, Ore., are rapidly approaching completion and will be in operation early in June. The plant has cost \$100,000, and will be capable of turning out 5 tons of nickel per day.

The firm of Krupp, in Essen, is preparing for the issue of 24,000,000 marks 4 per cent. bonds. The transaction is in connection with the lately-announced fusion of the Gruson works with the business of M. Krupp.

An electric towing vessel has recently been put into operation on the river Seine, near Paris, with marked success. A magnetized pulley of novel design is used, for which great efficiency is claimed.

The Union Pacific machine and car shops, the round house, 13 locomotives and other railroad property at Starbuck, Wash., have been burned. It is said that the loss will amount to over \$300,000.

HARDWARE.

Condition of Trade.

THE VOLUME OF BUSINESS is moderate, some leading houses referring to it as exceptionally quiet. Manufacturers, also, in most cases report a decided falling off in orders and are making their preparations for the summer dullness. In some lines, however, there is still an excellent demand and manufacturers are full of orders. Prices are without important change, and are, as a rule, lower than a year ago. While manufacturers are disposed to complain of narrow margins, it is gratifying to note that many of them are doing a profitable business, as evidenced by regular dividends. There is much complaint in regard to collections and a conservative course is being pursued in regard to credits.

Chicago.

(By Telegraph.)

Better weather has brought better trade in Shelf Hardware. The Northwest was visited by balmy winds the past week, and orders consequently show a distinct improvement. Packing floors here are more fully covered than they have been for the two or three weeks previous. The demand for Lawn Mowers and other garden tools has grown decidedly. Refrigerators, Screen Doors, &c., are moving very freely; Screen Doors particularly are in very short supply. Wire Cloth is firm at \$1.75. Poultry Netting is now quoted by jobbers at discount 75 and 10 per cent. Some heavy transactions in Tin Plate have occurred during the week. One order placed by a packing house called for 25,000 boxes, the contract having been secured by a local importing firm against the competition of leading importers in other parts of the country. Heavy Hardware is only moderately active, but the volume of business is really better than at the corresponding time last year, as this section of the country was then passing through a period of continuous rains which severely affected trade. Collections are rather slow, but no worse than they have been.

St. Louis.

(By Telegraph.)

Hardware jobbers report some improvement in the demand since our last report, particularly for shelf goods, and attribute it to the improved condition of the weather and also to the better tone of the money

market. The change in the weather has stimulated the trade in hot-weather goods, and Refrigerators, Ice Cream Freezers, Gasoline Stoves and Wire-Screen Windows and Doors are all in good demand. Builders' Hardware and Farming Tools are also included in nearly every order. Prices, while they do not show any improvement, are no lower, except perhaps for Barb Wire and Wire Nails, which are being shaded. The Southern trade is being interfered with on account of high water. A cut in the freight rate to Texas on some lines of goods has caused a heavy demand from that State. Collections are dull.

Notes on Prices.

Cut Nails.—The Cut Nail market is sluggish, with a moderate demand. Quotations are unchanged, being in the East on a basis of \$1.10 for carload lots at mill, from which price, however, concessions are made in some cases. Small lots from store in New York are held at \$1.35 @ \$1.40. In view of the present unsatisfactory condition of things, and the prospect of light trade during the next month or two, some of the mills are making preparation to shut down, and it is thought that this will be done earlier and for a longer time than usual.

Chicago, by Telegraph—Wheeling and other Nail centers are again competing quite aggressively for a share of the Steel Cut-Nail trade of this locality. The inducements offered, however, are not so large as in former times, when a cut of 5 cents per keg was common. A cent or two is now enough to influence an order. Prices for factory lots have been reduced to \$1.25 to \$1.30, Chicago. These prices, however, are not so cheap as they seem to be, because manufacturers are unwilling to take orders for base Nails for any considerable quantity. Prices on small lots from stock are continued at \$1.35 to \$1.40.

Wire Nails.—Wire Nails are regularly quoted at \$1.50 for carload lots at mill, but in some cases \$1.45 is obtainable. The volume of business is moderate and the tone of the market is not buoyant.

Chicago, by Telegraph.—Exaggerated reports of stocks of Wire Nails in manufacturers' hands are in circulation and efforts are being made to counteract the effects of such rumors. Prices on factory lots are somewhat easier and \$1.50, Chicago, is quite a general quotation. Carload lots, however, are selling at \$1.55. A somewhat better

feeling exists among manufacturers, notwithstanding the lower prices. Orders have begun to come in again and not a few buyers are telegraphing, so as to secure prompt shipment. A considerably better trade is expected in June, when many contracts now being filled will have run out. Jobbers report Wire Nails a little easier from stock, and while \$1.65 to \$1.70 are regular quotations, good buyers can shade them to some extent.

Barb Wire.—The Barb Wire market has developed no new features since our last report. The demand is moderate and prices steady. We quote \$2.45 to \$2.50 for Four Point Galvanized in carload lots at mill. Small lots delivered in New York are quoted at \$2.70 for Galvanized and \$2.30 for Painted.

Chicago, by Telegraph.—Manufacturers of Barb Wire have felt the influence of the better weather of the past week in the increased volume of business with which they have been favored. Trade, however, is very much below what they would like to have at this time of the year. They report no change in quotations, but continue to sell factory lots of Painted at \$2.20 and Galvanized at \$2.60. Jobbers have also enjoyed a better trade in this branch and quote prices steady at \$2.30 to \$2.70 respectively.

Cataract Window Brush.—Enterprise Brush Company, 17-21 College place, New York, are manufacturing this Brush, which they are selling to the trade at \$8 per dozen. A description of the Brush appeared in our last issue.

Grass Catcher.—Cleveland Novelty Company, Cleveland, Ohio, for whom the Ross & Fuller Association, 33 Chambers street, New York, are agents, are selling their Eureka and Bieder Grass Catchers at the prices given below:

	Per dozen.
Eureka.....	\$6.50
Bieder, No. 7.....	8.00
Bieder, No. 13, for high wheel Mowers	12.00

Saw-Filing Attachment.—Henry Disston & Sons, Philadelphia, are selling the Ball and Socket Clamp, with file and filing attachment, described in our last issue, at \$1.75.

Circular Warehouse Balances.—John Chatillon & Sons, 85-89 Cliff street, New York, have added to their line of Circular Warehouse Balances, largely increasing their assortment of these goods. The entire line, as now manu-

factured is given in the following list, which is subject to a discount of 25 per cent.:

No.	Pounds.	Dial.	Inches.	Each.
6,300 A.	50 by $\frac{1}{2}$	6	.....	\$7.00
8,300 A.	60 by $\frac{1}{2}$	8	.....	10.00
10,300 A.	50 by $\frac{1}{2}$	10	.....	15.00
7,300 B.	75 by $\frac{1}{2}$	7	.....	8.00
9,300 B.	75 by $\frac{1}{2}$	9	.....	12.00
300	100 by $\frac{1}{2}$	6	.....	7.00
8,300	100 by $\frac{1}{2}$	8	.....	10.00
10,300	100 by $\frac{1}{2}$	10	.....	15.00
310 A.	125 by $\frac{1}{2}$	8	.....	11.00
310	150 by $\frac{1}{2}$	7	.....	8.00
9,310	150 by $\frac{1}{2}$	9	.....	12.00
12,310	150 by $\frac{1}{2}$	12	.....	24.00
6,320	200 by $\frac{1}{2}$	6	.....	7.00
320	200 by $\frac{1}{2}$	8	.....	10.00
10,320	200 by $\frac{1}{2}$	10	.....	15.00
330	250 by $\frac{1}{2}$	8	.....	11.00
11,330	250 by $\frac{1}{2}$	11	.....	20.00
7,340	300 by $\frac{1}{2}$	7	.....	10.00
340	300 by $\frac{1}{2}$	9	.....	12.00
12,340	300 by $\frac{1}{2}$	12	.....	24.00
8,350	400 by $\frac{1}{2}$	8	.....	12.00
350	400 by $\frac{1}{2}$	10	.....	15.00
360	500 by $\frac{1}{2}$	11	.....	20.00
370	600 by $\frac{1}{2}$	12	.....	24.00

Puritan Coffee Pots.—The Puritan Coffee Pots, manufactured by Bronson Supply Company, 72 Beekman street, New York, are sold subject to a discount of 25 per cent. from the following list:

No.	20	30	40	50
Pints.	2	3	4	5
Per dozen.....	\$6.50	7.50	9.00	10.50

Motley's Adjustable Sash Holder.—Peter Motley, 750 South Broad street, Philadelphia, announces a reduction in the list price of his Adjustable Sash Holder, medium size, $\frac{3}{8}$ -inch, the list for which is now \$1.20 per dozen, instead of \$1.50 as heretofore. This price is subject to a discount of 40 per cent. This reduction is, we are advised, made because the demand has been greater for the medium size than for the other sizes, and, making them in large quantities, it is feasible to reduce the cost. The demand at present is referred to as being heaviest from screen manufacturers.

Spilker's Excelsior Miter Box.—J. J. Spilker, 48 and 50 Central avenue, Cincinnati, is the manufacturer of this article, a description of which was given some time since. The Miter Box is sold from the following list, which is subject to a discount of 20 per cent.:

3	4	5	6 inch.
\$7.50	\$8.50	\$13	\$15

Powder.—By action recently taken by Lafin & Rand Powder Company, the Hazard Powder Company and E. I. Du Pont de Nemours & Co., a reduction has been made in Eastern prices to make them correspond with those which apply in the West, so that now there is uniformity in quotations East and West. On lots of 1000 pounds or over, one sale, one shipment, and one consignee, a discount of 9 per cent. will be allowed, but for any less quantity no discount is given, except that to the trade in New York city and immediate vicinity a discount of 5 per cent. is allowed in keg lots.

Wrought-Iron Pipe.—This market shows some indication of improvement

and prices are a shade stronger than they have been. A number of heavy orders have recently been received and the mills are well occupied.

Standard Door Holder.—A description of this Door Holder appeared in our last issue. It is put on the market by E. J. Hussey & Co., 80 John street, New York. The Door Holder is sold to the trade in gold bronze and black finish at \$6 per dozen, subject to a discount of 40 per cent. Polished and nickel plated, it is sold at \$9 per dozen, subject to a discount of 30 per cent.

Jack Chain.—The manufacturers of Jack Chain have made a reduction in their prices, as they are giving somewhat larger discounts from the new list, which was adopted March 10, 1893.

Mrs. Potts' Sad Irons.—Enterprise Mfg. Company, Philadelphia, announce that all prices and quotations heretofore made on Mrs. Potts' Sad Irons are withdrawn, and that a new list will be issued in a few days.

E. C. Atkins & Co.'s Saws.—We give below the discounts on the Saws and Saw Tools manufactured by E. C. Atkins & Co., Indianapolis, Ind.:

	Per cent.
Atkins' Circular Saws.....	50&10
" Mill, Mulay and Drag Saws..	50&10
" Cross-Cut Saws.....	40
" One-Man Saws.....	40
" Wood Saws.....	40
" Saw Tools.....	40
" Handies.....	40

They have adopted, they advise us, the above as the established prices at which they sell to dealers, and to which the jobbing trade, their special agents, conform, no deviations from these prices being permitted.

Screen Wire Cloth.—The supply of Screen Wire Cloth continues quite insufficient for the demand, and those having stocks on hand are in a position to realize a handsome profit. There is a good deal of unevenness in the prices at which goods are sold, prices in some cases, we are advised, reaching as high a figure as \$2.50 or even \$3 per 100 feet. A quotation of \$1.75 to \$2 is more general. It is thought that the market will soon be relieved, as the Clinton Wire Cloth Company hope soon to be in a position to put some on the market.

Cordage.—There is little change in the price of Cordage, the market being represented by the following quotations for large lots, f.o.b. factory or New York:

Basis.	Cents.
Manila.....	8 $\frac{1}{4}$ to 8 $\frac{3}{4}$
Sisal.....	7 to 7 $\frac{1}{2}$
New Zealand.....	6 $\frac{1}{2}$ to 6 $\frac{3}{4}$

It is understood that some of the companies identified with the National Cordage Company may be in a position to enter the market soon, but thus far business has been in the hands of outside concerns.

Glass.—There have been no developments in the Glass market of especial interest during the past week, nor have

there been any changes in prices. Trade with jobbers remains comparatively quiet, the demand being limited to present requirements, which do not increase with more favorable weather.

Business in this line seems to be about where it was several weeks ago, and may be considered satisfactory, everything being taken into consideration. It is understood that additional members have been secured to the National Window Glass Company, from Baltimore, and that in the Philadelphia market established prices are being more closely adhered to. Various factories are closing each week, and will continue to do so until July 1, thus reducing the production of Glass. The fact that present stocks are not large, taken in connection with decreased production, points to a scarcity, especially in desirable sizes, and a possible increase in prices. Imported Glass remains in the condition reported last week, showing no improvement in demand or price. The unfavorable spring weather has had a depressing effect on Plate Glass; so much so, in fact, that the demand for it is exceedingly limited. It is reported by a Pittsburgh paper devoted to the Glass interest that the Kokomo and Elwood factories of the Diamond Plate Glass Company, the Charleroi Plate Glass Company, Charleroi, Pa., and Crystal City Plate Glass Company, of Crystal City, Mo., have become part of the National Plate Glass Company, and that last week these factories were shut down to allow of an inventory of stock and properties to be taken, preparatory to turning them over to the new company.

This new concentration of capital may be able to reduce stocks and hold up prices, at least to such an extent as to improve the present condition of the market. It is understood that Plate Glass jobbers from all points west of the Alleghenies to the Pacific slope recently met in Chicago and organized the Western Plate Glass Jobbers' Association, with headquarters at Chicago. It is stated that the object of the new association is to maintain prices and to be prepared, if necessary, for any move the manufacturers may make that would be prejudicial to the interests of jobbers, but that the jobbers are disposed to act in harmony with the manufacturers. Quotations are as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17 $\frac{1}{2}$ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7 $\frac{1}{2}$ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Export Notes.

THE HON. THOMAS RYAN, until recently United States Minister to Mexico, was the recipient on May 2, in the City of Mexico, of a farewell banquet, which was tendered to him by the American residents in that country. The seat of honor at the banquet was occupied by the departing minister and that opposite to him by his successor, the Hon. Isaac P. Gray. Numerous toasts were drank to the health and prosperity of the retiring minister and Mrs. Ryan. There were also toasts to the Hon. Isaac P. Gray, the President of the United States, the President of Mexico, the Queen of Great Britain, the American ladies and the English ladies and the American Colony, the latter being by Mr. Ryan. The banquet served to emphasize the high esteem in which Mr. Ryan is held in Mexico and he is recognized as having filled his position of minister to that country with exceptional efficiency. The fact that his successor is a gentleman fully qualified to discharge the duties of this important mission was also referred to as a matter for congratulation.

A prominent London house with branches in Australia refers in the following terms to American Hardware and its position in the colonies :

The position of American Hardware has become so established a fact that there is little scope for remark thereon. Agricultural implements from your country enjoy a very prominent position in the Australian Colonies, and Axes, Cane Knives, &c., appear to maintain their premier position. For Woodware, particularly Axe and other Handles, the trade is exclusively American. There are many other lines in which you compete closely with Germany and this country, and we have no doubt that when you reduce the cost of your manufacture by modifications in your tariff you will enjoy a greater share of the Australian trade than you do at present.

The depression that has been ruling for some two years past in Australia appears to be now coming to a head, and we look forward to a marked improvement in demand at a no distant date.

E. M. Griffiths, London manager of C. W. Burton of 158 Queen Victoria street, London, E. C., who handles largely specialties in American Hardware, has advised a New York correspondent he expects to visit America early in June, with a view principally to visit the exposition at Chicago. This concern handles the Tanite Emery Wheels, Standard Tool Company's Twist Drills, and goods of sundry other American manufacturers.

Paul Roux of the well-known Parisian importing house of Ph. Roux & Co., 54 Boulevard du Temple, arrived in New York on May 14, on the "La Champagne." His time in America will be divided between American manufacturers, from whom his house buys largely, and the Chicago fair.

J. L. Brown Company, Pittsburgh, Pa., in introducing what they term the

Augite Stove Mat or Woman's Friend, sent some samples to New Zealand by mail. The article must have struck the fancy of the trade there, for we are told an order for 100 gross was cabled for at once. The device is a circular sheet of indestructible material bound with a metal edge, and is used on top of stove, range, gas or oil stove, &c. It is claimed milk, coffee, chocolate, cereals, &c., can be delicately cooked in a single vessel with no risk of boiling over, burning or scorching—needing no watching. John G. Rollins, 15-25 Whitehall street, has just been made export agent for the English market.

Norton & Son, 90 Water street, agents of the Norton Line of steamers to the River Plate, are in receipt of a cable announcing the safe arrival of their steamer "Ardanmhor" at Montevideo, May 13, having left this port April 19. This makes a passage of between 24 and 25 days, which is referred to by them as very satisfactory. The steamer "Bamboro" is announced for departure about May 20, although, possibly, it may be a little later, while the "Iona," of the same line, which will take freight through to Colastine, is scheduled for June 10. The next sailing date will be June 27.

R. H. Dana of the R. H. Dana Company has recently returned to New York from London, where he has been for some months on business.

A shipment of three or four carloads of Agricultural Implements to go abroad, made by D. M. Osborne & Co., Auburn, N. Y., was noticed the other day.

S. L. Allen & Co., Philadelphia, Pa., recently consigned 250 Harrows to the port of Marseilles and 100 for Bordeaux, on account of a prominent French house.

C. M. Coulter, secretary of the Walter A. Wood Mower & Reaper Machine Company, is now in Naples, Italy, having returned to Europe after visiting the trade in Montevideo, Buenos Ayres, Rosario and other River Plate ports. While in South America he crossed the continent to Valparaiso, Chili, visiting their various interests there and at other West Coast points. He will remain in Europe some time yet, but will return to America before the close of the exposition.

At the close of last year an exhibition of skill in sawing timber was held at Latrobe, Tasmania, Australia, under the auspices of an association formed by the bushmen of the colony, substantial prizes being awarded to the most successful sawyers. In a letter received by Henry Disston & Sons from H. A. Nicholls, the honorary secretary of the association, they are informed that the sawyers who were first, second and third in both the single-handed championship and handi-

cap and the first and second in the double-handed sawing all used saws of their make. Mr. Nicholls states that the members of the association are prepared to back their champion sawyers, equipped with Disston's saws, against any sawyers in the world, equipped with any make of saws. In support of this statement Mr. Nicholls further states that matches can be made for £500 a side on any sized log, and that in the event of an American taking up the challenge £50 would be allowed toward traveling expenses to Tasmania. Or if sufficient inducement in the way of prizes was offered, competitions might be arranged for in Chicago or any other American city, and Tasmanian axemen and sawyers would be willing to attend them, bringing, if required, Tasmanian timber, so that matches could be made for sawing on both Tasmanian and American timbers. At the annual meeting of the association at Latrobe, held on January 27, it was decided to hold the next exhibition of skill in sawing on November 29 and 30 of this year at Latrobe, and a resolution was passed to increase the prize list. The money prizes to be awarded at the exhibition will amount to £468, and with trophies amounting in value to about £200 a very keen competition should result. Henry Disston & Sons' Tasmanian agent also forwards them a letter received from Colin C. McPherson, who claims to be the champion sawyer of the world, in which he testifies to the excellence of their saws.

Riccardo Grassi of Milan, Italy, recently arrived in this city from France expecting to spend some time in this country. The object of his visit is to ascertain what metallurgical products can advantageously be exported from this country into the markets of Europe, in which his trade is located.

William Poole of A. & J. Main & Co., agricultural and roofing engineers, iron fence manufacturers, &c., Edinburgh, Scotland, recently arrived in New York and soon after left for Chicago to see the exposition.

The Columbia Scale Company have been organized at Pleasant Hill, Mo., for the purpose of manufacturing Scales under patents recently issued to Messrs. Clawson and Wheeler of Pleasant Hill. The Scales are portable, and are referred to as requiring no pit, thus, it is claimed, preventing freezing in winter. The Scales are constructed entirely of iron and steel. We are advised that a Scale of 20 tons capacity has an elevation of but 9 inches, and being self-contained is easily removed from place to place. The officers of the new company are E. G. Wheeler, president; I. T. Russell, treasurer, and A. W. Young, secretary.

PEERLESS MFG. COMPANY, Cleveland, Ohio, have secured the services of Harry Chapman, late superintendent of the Leicester Cycle Company of Leicester, England, who will take charge of their bicycle factory. The Triangle wheel which they are putting on the market is fitted with the well-known French tire which won so many prizes in France last year and which is called the Burris-Michelin tire.

Southern Hardware Jobbers' Association.

THE ANNUAL MEETING of the Southern Hardware Jobbers' Association, held at Atlanta, Ga., April 25 and 26, to which we referred at some length in our issue of May 4, was one of much interest and importance, and was largely attended. Reports were made by the able president and secretary which indicated not only an increase in the membership, but also that a larger scope of work had been attempted, and that the influence of the association was extending.

President W. E. Gibbins, in his annual report, after referring to the last annual meeting, held in Memphis, spoke of the encouraging work of the past year, in part as follows:

Our main efforts the past year have been in the direction of a more liberal and just freight classification. This work has been in charge of your Freight Rate Committee, consisting of W. P. Smith of Knoxville, Edward Buford of Nashville, and Fred. Orgill of Memphis. How ably and willingly these gentlemen have performed the labors connected with this department of our work will be made known to you in their report.

I wish to make mention in this report that the Rate Committee of the Southern Railway & Steamship Association have extended to your Freight Committee the most kind and cordial reception, and patiently heard their arguments in favor of a change in the Hardware classification.

At our annual meeting in Memphis, one year ago, we had a membership of only 43; to-day we have a membership of 54.

Nearly every wholesale Hardware firm in the South, leaving out Louisville, Ky., New Orleans, St. Louis and the State of Texas, are members of your association. This alone is sufficient evidence that the Southern Hardware Jobbers' Association has been a success. We are now in a position to prosecute the work that may be undertaken in future with more vigor.

The larger our membership the more powerful our influence. Evils that exist in the territory in which we operate will be more easily remedied in the future than in the past. The rights of the Hardware jobbers will be more generally respected by manufacturers of the products we sell, and more firmly insisted on by this association as a body. I believe that it is our duty to take a firm stand for mutual protection and all work harmoniously together for the purpose of building up and advancing the interests of the Hardware jobbers of the South. Our meeting together in annual session is of great benefit to us all. We get valuable suggestions from each other that will be profitable; we get acquainted with each other and form friendly attachments. While we are competitors, from a business standpoint, our acquaintance and friendship are the means of making us more honorable in competition, and to not strive so hard to "cut our neighbor's throat."

After thanking the association for the honor conferred upon him by electing him to the office of president for the two terms past, referring pleasantly to the able assistance rendered by W. P. Smith as secretary, and to the faithfulness of the Executive Committee, the president men-

tioned the deaths of prominent Hardwaremen in the South. The secretary, W. P. Smith, followed the president in presenting his annual report, and called attention to the fact that the second year of the association closed with 54 members, composing almost all the Hardware jobbers embraced within the territory covered by the association. After referring to the good which the body had been able to accomplish during the past year, he continued as follows:

As a result of the meeting in Memphis one year ago, some of our members, realizing that certain lines of goods had heretofore been sold at a loss when there was apparently no call for it, determined to sell such goods for a reasonable margin of profit, and as a result of such determination they have each sold their usual quota of goods, and, we trust, with a marked difference on the right side of the balance sheet.

During the past year your secretary has corresponded with a large number of manufacturers in regard to selling retailers at jobbers' prices, and on many other evils with which the Hardware trade is burdened, and in nearly all cases they have responded satisfactorily. We find, however, that some manufacturers persist in making no distinction between the small dealer and the carload buyer; and so long as the jobber persists in purchasing from such manufacturers he is simply sharpening the dagger for his own bosom. For example: One of the largest items of expense connected with selling goods is the salary and traveling expenses of the traveling salesman. The percentage of this expense is controlled by the traveling man's sales. If he can succeed in selling the jobber who buys largely, the percentage of his expense is reduced to the minimum; whereas, if he depends alone on the small trade, the percentage of expense is increased to such a degree that the jobber can easily compete with him and make his usual margin of profit.

Our association has dealt quite leniently with such manufacturers in the past; but it seems to me that it is about time to draw a line. Of course we do not for one moment assume any right, either as individuals or as an association, to dictate to manufacturers to whom they shall sell their products. Far from it; but so long as we live in a free country, and are at liberty to buy our goods from whom we please, I think that we should always give the preference to those who will work for our interests.

You have all doubtless noticed an article in the April 20th issue of *The Iron Age*, entitled "What Retailers Say in Regard to Sales to their Customers by Manufacturers and Jobbers." If a jobber has a retail department, he should make a difference between his jobbing price and retail price great enough to allow his customers (the retailers) a reasonable margin. In other words, the jobber bears exactly the relation to the retailer that the manufacturer does to the jobber, and if we, as jobbers, being the middlemen, can succeed in inducing the manufacturer to confine his sales exclusively to the jobber, and then succeed in inducing the jobber who also retails to make the proper difference between his jobbing price and his retail price, we have certainly made a great stride toward placing the Hardware business on a plane which it should have long ago reached, but this can only be done by hard work and united effort.

The Freight Rate Committee, appointed at the last annual meeting, presented a report in substance as follows:

The movement that was begun prior to our last meeting for the reduction and more liberal classification of Hardware with the Southern Railway & Steamship Association was followed with diligence by your committee.

On July 3, Fred. Orgill and W. P. Smith of the committee, together with our president, W. E. Gibbins, and O. B. Barker of Lynchburg, Va., attended a meeting of the Rate Committee of said association at Manhattan Beach, Coney Island, and were cordially received, and our brief address given marked attention, with the promise that same would receive careful consideration.

At the following meeting, which was in September, the report of the Special Committee on Revision was adopted, but it did not go into effect for some months, on account of delay in printing. This revision is not as general as we asked for, nor as much of a reduction as we expected, yet all other lines which were in any way changed were advanced, while ours were reduced, and, considering the fact that a large percentage of the roads composing this association are in the hands of receivers, we feel both elated at the success which we have achieved and very grateful to the gentlemen composing the Rate Committee for, in a measure, righting a wrong which has long existed.

There are yet many articles in the Hardware line on which we are forced to pay excessive freight, by reason of high classification, and which will in time be reduced to where they properly belong; but this can only be accomplished by pointing out such inequalities to the Rate Committee and making comparisons with other lines of similar bulk, weight and value.

World's Fair Exhibits.

RUSSELL & ERWIN MFG. COMPANY in their advertisement on another page call attention to a large and complete exhibit of their products in Section Q-99, Manufactures and Liberal Arts Building, and cordially invite inspection of their display of Builders' Hardware and Art Metal Work in bronze and steel, including Wrought-Steel Door Locks, also of Screws and Bolts with helicoid shanks, and other new and interesting examples of development in manufactured Hardware. As an exceptionally large and complete exhibit of American Hardware it is especially worthy of attention.

OUR HARDWARE FRIENDS will be interested in knowing that the Audubon, at Woodlawn Park, Chicago, managed by the Hardware veterans, Montross & Coolidge, is already receiving a fair share of World's Fair patronage. The surroundings are referred to as agreeable, and the convenience of its location, being within a few short blocks of one of the main entrances to the fair, is not one of the least important advantages it possesses.

CHAPMAN MFG. COMPANY, Meriden, Conn., have an exhibit representing the three departments of their business—Saddlery Hardware, Sleigh Bells and Dog Collars. These departments are represented in one large case, 20 feet by 8 feet. The exhibit is located in Section P, Manufactures Building. The platform is nicely furnished with carpet, desk, chairs, &c., and the company have endeavored to make their headquarters at the fair comfortable, so that customers may stop and rest, and use the desk, stationery, &c.

THE COBURN TROLLEY TRACK MFG. COMPANY, Holyoke, Mass., have an exhibit in the Transportation Building which covers 300 square feet of space.

The various systems to which trolley track is applied are shown in full size working order, as well as complete models of Sliding Parlor Doors, Car Doors, Fire Doors, Store Ladders, Overhead Trackage system and Fire Shutter system with the automatic self-closing device, invented by W. H. Brodie. The company have several representatives at the exposition who will be pleased to give visitors any desired information in regard to the use and construction of their various manufacturers.

P. A. FRASSE & Co., 95 Fulton street, New York, importers and dealers in Fine Tools, Machinists' and Jewelers' Supplies, &c., have about got their exhibit of Borloz Swiss Files installed at the Columbian Exposition. This company have had the agency of this celebrated make of Files for about a year. The secretary of the concern, Adolph Brion, is now in Chicago in charge of the exhibit. The Files are shown in two carved mahogany cases, highly polished, 10 x 8 feet in dimensions. Each set of Files is numbered, and at the bottom of the cases will be found a description of the goods, indicating what they are used for principally.

THE CINCINNATI TOOL COMPANY, Cincinnati, Ohio, have a large and complete exhibit of their goods at the exposition, in Section P, Block 4, No. 49, Manufactures Building, and cordially invite inspection by the trade of their display of Mechanics' Tools. They have an 18-foot space, surrounded by nickel-plated railing, in which are shown five showcases, two flat ones, two uprights, and one large 100-foot wall case, filled with beautifully finished samples of their goods. Their line of Spoke Shaves, Spoke Pointers, Brace Wrenches, Washer Cutters, Bench Stops, Plug Cutters, Hollow Augers, Countersinks, Bit Gauges, Pliers, Screw Drivers, Clamps, Saw Vises, Tail Screws, Bell Hangers' Bits, Drills, Auger Handles and Belt Punches is thus appropriately and handsomely displayed. Copies of the company's catalogues may be obtained at the Ohio State Building.

COVENTRY MACHINISTS' COMPANY, 239 Columbus avenue, Boston, are not exhibiting at the World's Fair. The machines intended for this purpose had all been prepared, but at the last moment the company decided to exhibit these Wheels at their Chicago store, 296 Wabash avenue, rather than at the fair.

BOWERS, GALPIN & Co., Binghamton, N. Y., will not exhibit at the exposition owing to an unfortunate mishap to their machinery, by which they were unable to get their display ready in time. They advise us that they successfully turned out a Trough 144 inches long, an achievement which they claim has never before been accomplished in seamless lengths.

DAVIS & COOK, Watertown, N. Y., have a space 6 x 4 feet on the gallery floor of the Manufactures and Liberal Arts Building, Section E. The case displaying their goods is 8 feet in height and is made of cherry, finished in the natural wood, glazed on the four sides. The Levels are placed on shelves.

GASTON, WESTON & LADD, 15 Murray street, New York, made application for space at the exposition, which was in due course allotted to them, but owing to a sudden increase in their business they were obliged to give up the matter of an exhibit, so that they are unrepresented at Chicago.

THE FOOS MFG. COMPANY, Springfield, Ohio, have three exhibits at the fair, two of which are in the Machinery Annex, as follows: Section 32, PQ 30, a full line of their special Crushing

and Grinding Mills, and section 10, DE 51, a line of their Scientific and Cyclone Forges, Hand and Power Blowers, Drill Press, &c. In the Agricultural Building, No. 128, EE 5, the company show a full line of their Feed Mills, Corn Planters, Corn Harvesters, Corn Shellers, &c. R. H. Foos is in charge of the exhibit.

THE PRINCIPAL EXHIBIT of the Champion Iron Company, Kenton, Ohio, located in the Manufactures Building, consists of fine interior Finished Iron Work, Ornamental Stairs, Railings, Balustrades, Newel Posts, Yard Ornaments, Fences, Crestings and Store Fronts. The company have adopted white as the standard color of the display, and it is referred to as showing off the exhibit to advantage. Their Steel Cell Work is shown in the Anthropological Building, and consists of cells and corridor and all the trimmings for a modern jail. The doors are locked with their patent lever locking bar.

ATLAS TACK CORPORATION, Boston, are exhibiting their goods in a large, elegant and expensive case. The frame of the case is the same as that which was used by A. Field & Sons at the principal expositions for some years back, including those at Philadelphia and Paris. The case has been made over again to adapt it to the more extensive line of the Atlas Tack Corporation and the new additions to the business. We are advised that it has been commended by the authorities at Chicago as being creditable alike to the fair, to Massachusetts, to the country and to the corporation as exhibiting their line of goods in the best manner. The corporation are also exhibiting their Pilgrim Spring Bed. The product of their Bed department. This Bed is made of highly-tempered steel wire.

AMERICAN SCREW COMPANY, Providence, R. I., are represented by three exhibits at the exposition, as follows: Machinery Hall (annex), Section 29, K 50, machines for cold forging; Screws, Bolts, &c.; Manufactures Building, Section P, Block 3, No. 2, cabinets containing samples of cut and forged products, also cabinet covering four large Wood Screw models illustrating the progress made in the manufacture of Wood Screws in this country; and United States Government Building, (Patent Office exhibit), 19 models of machines, loaned by the company, showing the development of successful Wood-Screw making machinery in the United States. In their exhibit of Forging Machinery in operation the company show one "header" and one "threader," which are referred to as sufficient to demonstrate what a revolution has taken place in old methods.

Following the discovery of Sir Henry Bessemer, results by cold forging or molding are made possible that were hitherto unattainable except at enormous expense. The company state that when the automatic Screw machinery came into general use and so-called gimlet-pointed Screws were reintroduced, about 50 years ago, the method of forming a Wood Screw was the same as it had been from earliest times to 1886—i.e., by the cutting process. The inventions of their superintendent, Charles D. Rogers, however, for cold forging were the first successful attempts to accomplish the result the company have now attained. The company have issued a neat folder in which they intimate that they will be glad to have their friends and customers make their store at 19 Lake street, Chicago, their headquarters while in the city, where mail and telegrams can be sent in their care, and where accommodations will be provided for letter writing, &c. They also state that while they are not in

the room-renting business and have no interest in any hotel or boarding house, they are prepared, for the convenience of their friends, to suggest names of parties having accommodations for visitors, where they will be well cared for at rates varying according to location and desirability of rooms, but consistent with accommodations furnished.

Manufacturing.

ON SATURDAY EVENING, May 20, fire destroyed a portion of the American Axe & Tool Company's plant, at Douglas, Mass., including the Axe polishing and finishing departments, a three-story stone building, a grinding shop, tempering shop and engine house. The loss is thought to be about \$75,000, and is fully insured. The Hatchet and Tool shops being situated in another part of the town were not injured, and orders for these goods will not be delayed. The Axe-finishing works will be rebuilt immediately, and the company do not anticipate any serious delay in executing Axe orders.

Tripp Brothers & Co. of Sodus, N. Y., doing a general foundry business and manufacturing Apple-Paring and Slicing Machinery, have dissolved partnership, A. J. Barber retiring. The firm name will be Tripp Brothers hereafter.

New Castle Wire Nail Company, New Castle, Pa., contemplate making something of an addition to their plant in the near future.

The Sneed & Co. Iron Works, Louisville, Ky., have, during the past three years, added to their structural business the making of ornamental Iron Work, and have, they advise us, one of the largest electro-plating plants in the country and a large Bower-Barff furnace for treating ornamental Iron Work for buildings. The firm are now doing the work on some large contracts in Chicago, notably the new Marshall Field Building, which is just being completed. This has a large amount of artistic forged Wrought Iron Work in Louis XIV style, which they consider very creditable.

Elbel & Co., Canton, Ohio, advise us that they have never been so busy as at present. They will soon increase their facilities, replacing the present engines with larger ones and putting in new boilers. With these changes they state that the capacity of their Nickel, Tinning and Japanning rooms will be doubled. The firm's exhibit at the World's Fair can be found in the Transportation Building gallery, section A, No. 1.

John Dickinson, 64 Nassau street, New York, importer of Diamonds and Carbon, carries a full line of this class of goods for sawing and working stones, rock drills, prospecting, mines, dressing mill stones and other mechanical purposes. He is also patented and sole manufacturer of Shaped Carbon Points, and dealer in Diamond Drill Lathes, Glass Cutters, &c. This house was established originally in England in 1796, and in this country in 1819.

Boyce & Weeks, whose Handle factory, located at Muncie, Ind., was recently destroyed by fire, resumed work on May 15. They have refitted their factory with new machinery and have increased their manufacturing facilities. They advise us that the short delay will not interfere in any way with orders taken previous to the fire.

American Saw Company, Trenton, N. J., refer to business in general as very fair, the Wrench branch being particularly lively and somewhat beyond their capacity to execute. They state that the Curtis Wrench is meet-

ing an active inquiry, and the company expect that before long its sales will equal those of the Alligator.

E. D. Clapp Mfg. Company, Auburn, N. Y., advise us that they have until a short time since been running overtime to supply the demand for their goods.

Atlas Tack Corporation, Boston, have had a very good volume of business during the past five months, their sales for that period being considerably in excess of those for a similar time last year. Although they do not look for a very active business during the summer months, they express the opinion that the total business for 1893 will compare very favorably with that of the past year.

Curtis & Curtis, Bridgeport, Conn., report business very good. They are intending to erect an additional building which will nearly double the capacity of their plant. The building will be equipped with the latest and most approved tools and machinery in this line.

C. Rogers & Bros., Meriden, Conn., have added a new four story brick factory to their plant, for the purpose of making a high grade of Cutlery, such as Knives, Forks, &c. They are also about putting on the market an elegant new design of Spoons, Forks and other silver plated table flat ware. The name of the new pattern will be Imperial.

Baldwin Refrigerator Company, Burlington, Vt., advise us that for the past two seasons they have had all they could do to fill orders and state that at the present time they are unable to turn out goods fast enough to meet the demand, although they have been running their factory for months past to its full capacity.

Hoopes & Townsend, Philadelphia, have decided to enlarge their plant, and with this end in view have purchased a lot 230 x 180 feet. The erection of three buildings on this lot is contemplated.

Trade Items.

CHURCH & SLEIGHT, 109 Fulton street, New York, importers and dealers in Machinists' and Jewelers' Tools, Supplies, &c., have recently been appointed sales agents for Jewelers' Dies, made by George D. King & Son, Attleboro, Mass., for the territory embraced in the cities of New York and Newark, N. J.

THE WASHBURN & MOEN MFG. COMPANY, 107 and 109 Lake street, Chicago, have made extensive alterations and improvements in their offices and sales-rooms. The office space has been enlarged 50 per cent., and much better facilities are now enjoyed by the employees. The salesrooms have been removed to the second floor.

THE LAMSON & GOODNOW MFG. COMPANY, makers of Fine Table Cutlery, &c., have brought out three new styles of Carvers mounted in handsome stag with sterling silver caps and ferrules, having what will be known to the trade as Premier blades. In their regular line of mounted goods they have a dozen new and attractive designs of Carvers. They are also offering a desirable orange Knife made up in saw and prong blades in the various kinds of handles. We also noticed among their samples 10 or 12 recent patterns in scale tang medium table Knives and Forks.

SHEDDARD HARDWARE COMPANY, Buffalo, N. Y., whose plant was destroyed by fire a short time since, advise us that they have received inquiries as to whether their well-known Lightning

Ice Cream Freezers will be on the market for 1894, and desire us to state for the information of the trade that the Lightning Freezers will certainly be made and offered to the trade in ample time for the season of 1894. The company are still occupied in making up statement of loss for the insurance companies.

JOHN CURRAN, 109 John street, New York, has succeeded George Sanderson & Co. as agent for the sale of steel in the United States made by the old-established house of W. K. & C. Peace, Sheffield, England. Mr. Curran is also sales agent for John Rothery's hand-cut Files.

THE PLUME & ATWOOD MFG. COMPANY, 18 Murray street, New York, have now their new line of table and banquet central-draft Lamps ready for the inspection of buyers. They are made in numerous shapes and styles and finished in gilt, nickel, silver, black, oxidized copper, satin silver and satin gold finishes. A number of them are made with onyx, joining the base and founts. There is also a new patent lighting lift, which has recently been added to the burner as formerly made.

YALE & TOWNE MFG. COMPANY have entered the field with a large line of Cabinet Locks, well made and moderate in price. These goods will come in competition with similar Locks long made by Eagle Lock Company, P. & F. Corbin and Charles Parker Company. The Locks are now in stock at the depots of the company and a line of samples have just been mounted and put in place.

HENRY GREENER, of the firm of W. W. Greener, Birmingham, England, who manufacture fine Shot Guns, arrived in this country about three weeks ago and is now at Chicago. He expects to return to England about June 1. His New York address is with Henry C. Squires, 178 Broadway, who is sole agent in the United States for this make of Guns.

W. R. WALKLEY, of Peck, Stow & Wilcox Company, has been invited to prepare and read a poem before the Phi Beta Kappa Society on the occasion of the one hundred and tenth annual commencement of Dickinson College, Carlisle, Pa. Hon. A. K. McClure, editor of the Philadelphia Times, will deliver the oration of the evening, immediately preceding Mr. Walkley. The exercises will be held in Basler Memorial Hall. Rev. George E. Reed, D.D., LL.D., formerly of Brooklyn, N. Y., is president of the college.

THE TRADE will observe the advertisement of Travers Bros. Company, 107 Duane street, New York, in which they call attention to the line of Rope, Binder Twine, &c., which they are putting on the market. This company, as our readers are aware, have been and are independent of the National Cordage Company, and they advise us that they are in a position to fill promptly all orders intrusted to them, their object being to supply the Hardware jobber on advantageous terms and provide him with honest goods.

GEO. H. ARMSTRONG, Western traveling agent for E. C. Stearns & Co., Syracuse, N. Y., sailed for Europe on the "Britannic" on the 24th inst. in the interest of the firm. He will return in August to carry out his engagements in the West.

A. B. RUDY & SONS, Millersburg, Ohio, notify the trade that their store was burglarized on the 19th inst. of 30 dozen assorted Penknives, marked "Empire Knife Company," a few marked "American Knife Company" on blade; 6 dozen George Wostenholme's Razors, and a lot of American and British Bull Dog Revolvers, central

fire. They offer a liberal reward for the apprehension of the thief and the recovery of the goods.

HENRY C. SQUIRES, 178 Broadway, New York, has recently been made the sole agent in New York City for the sale of the Imperial Bicycle, made by Ames & Frost Company, Chicago, Ill. He is also the agent in the United States for Shot Guns made by W. W. Greener, Birmingham, England, and is making a comprehensive exhibit at the Columbian Exposition of all kinds of Hammerless Shot Guns of this make. The display is located in the Manufactures Building, Stall H, No. 171, in the British section. Mr. Squires is also sole agent in this country for G. Kynoch, Birmingham, England, who, it is stated, is the largest manufacturer of Sporting Ammunition. The Boat business is referred to by Mr. Squires as opening up in a very satisfactory manner, better than heretofore, also earlier in the season. Mr. Squires has just finished loading 1,000,000 Shot Gun Shells for sportsmen, which has been done within the past 12 months. They were all hand loaded, except the crimping of the edges.

FRENDS OF T. C. HOAGLAND, with the Henry B. Newhall Company, 105 Chambers street, New York, will be glad to learn that from a severe illness which began in April he is now convalescent, and expects in a short time to resume his business connections and to visit the trade in New York and the New England States.

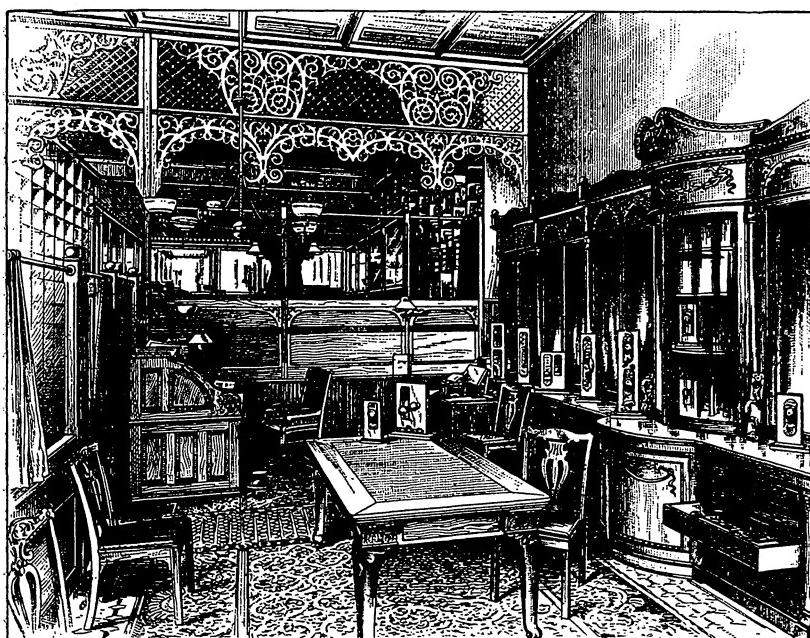
The Ludlow-Saylor Wire Company's Catalogue.

THE LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo., are sending to the trade a very handsome catalogue containing illustrations of work made in their art metal department, which is comprehensive in form, and will prove welcome wherever received. The catalogue in question is 10 x 15 inches in size, handsomely bound in heavy cardboard covers, and printed upon a high grade of paper. The engravings are all of recent date, and are well executed in every way. The front outside cover contains an artistic design in Wrought Iron, with elaborate scroll work, in which is worked the firm name and address. The announcement on the first page refers to the well appointed factory which the company have, and the high class of artisans which they employ. Particular reference is made to their plating department which, they state, is complete in every detail, enabling them to electro-plate their product in all the modern finishes, such as brass, bronze, copper or silver, either bright or oxidized, and by a process in dipping they can produce any of the delicate tints so highly esteemed by connoisseurs in art metal. The first six pages contain engravings made from photographs of outdoor work, in which are included artistic Wrought Iron Gates and Posts, Lamp and Electric Light Posts, boulevard Gates and Fences, bank Gates and entrance Gates to office buildings, &c. Then in succession follow artistic Iron Lamps, Grilles, bank Counter and Partition Railings, Iron Balustrades, theater trimmings, such as Foot Rails, Proscenium Railings, &c., elevator inclosures and Cages, Hinge Plates made from original designs, fancy Fire Screens and Fenders, &c. The last pages of the catalogue are devoted to views of the Chemical National Bank and Commercial Bank of St. Louis, showing Railings, Partition and general inside furnishings which were supplied by this company. Taking the catalogue in its entirety it is a work of art, and reflects great credit on the company who are sending it out.

Reading Hardware Co.

WE HAVE ALREADY referred to the remodeling of the Western warehouse of Reading Hardware Company at 73 Wabash avenue, Chicago, the work connected with which was completed a few weeks since. In the new arrangement the

Builders' Hardware manufactured by the company. Each drawer contains a full set of Hardware of a particular finish. The upper part of the case is inclosed with glass doors and back of the glass doors are arranged a number of solid wooden doors, made narrow enough to open through the same opening as the glass doors. Back of



Reception and Sample Room.

company's facilities for the transaction of business have been considerably enlarged and improved, two additional floors being now occupied by the company. The entire front of the main floor, which is on the street level, has been thrown into a very handsome office, superbly finished in oak. The walls are all wainscoted with beaded oak from floor to ceiling. The ceiling is paneled with oblong panels of oak. An elegantly carved oak railing, over which is a brass rail supporting artistically draped curtains, sets off one side of this room, forming a corridor leading to the store in the rear. The other or larger side of the room forms a reception room, being supplied with massive leather-covered furniture, carpeted with a wilton rug and fitted along one side with a fine wall showcase, while in the rear stands the desk of manager W. H. Bennett. This showcase is illustrated in the accompanying engraving, which also gives a view of the office. The showcase was built by the Union Showcase Company, 169 Randolph street, Chicago, after designs made by secretary John Harbster of the Reading Hardware Company, with some suggestions of Mr. Bennett embodied.

It is a model of artistic beauty as well as practical convenience in the collection and display of samples. The lower part consists of a number of drawers, in which are placed handsomely finished boards to contain samples of Knobs, Escutcheons and other large parts of the fine line of

these wooden doors a place is left of some 5 or 6 inches in depth. Samples of such small goods as Drawer Pulls, Sash Lifts, Sash Locks, &c., can be fastened on both the inside and outside of these solid doors. The back of the inner case is also lined with wood, each board immediately opposite the door being movable. The samples fastened on this movable back can thus be lifted out for inspection. By this

Movable Nail Bins.

THE ACCOMPANYING CUT represents movable Nail bins, being introduced by W. J. Clark & Co., Salem, Ohio. The bins are made of sheet steel of a gauge or thickness sufficient to insure stiffness without needless weight. The top edge of the front and back ends are rolled so as to form hand holds, by which any one of a row of them can be drawn out from its place and lifted if need be to pour off its contents into scales or other receptacles.

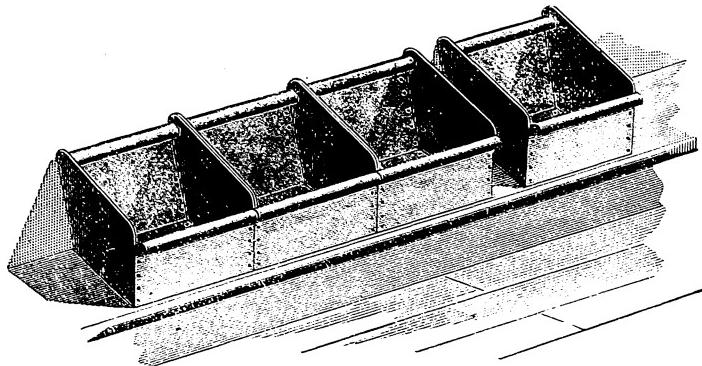
They are made similar to bins generally used for such purposes—high at the back and low in front in order to show, and make it convenient to get at their contents. The sides are higher than the fronts, the object of which is to keep from spilling over the sides when they are lifted and tilted to pour from one corner.

The bins are designed for Nails and other small articles of Hardware which are kept in bulk to be retailed from.

The company have recently furnished an Eastern retail Hardware store with them, the proprietors of which claim them to be an improvement on the common immovable bins.

The Champion Iron Company, Kenton, Ohio, have rebuilt their foundry and core rooms and enlarged them until they now have one of the best equipped foundries in the State. Owing to the fire of April 16, which destroyed their foundry and core rooms, they have been somewhat delayed in their work, but they advise us that they are now in shape to fill all contracts promptly and are in better condition than ever before.

The new factory of Waddel Wooden Ware Works, Greenfield, Ohio, is now in active operation, and we are advised that Cash Registers, Money Drawers, Automatic Registers, Ideal Coffee Mills, Animal Traps, Inkstands, Toys, &c., are now being made and will be placed upon the market at once. Jno.



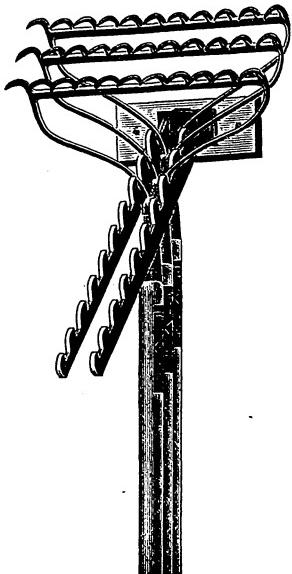
Movable Nail Bins.

arrangement three times the space for the display of samples is secured in the case that would be available under the ordinary arrangement of a closed front and a solid back. The projection seen on the case was merely an architectural device to break the otherwise plain front of the long case.

M. Waddel, who established the Jno. M. Waddel Mfg. Company, who were recently succeeded by the Sun Mfg. Company, informs us that he is the sole owner and manager of the new company. He states that nothing but first-class goods will be turned out, and that the chief characteristics of the manufactured articles will be novel ideas with convenient features.

New Rake Bracket.

FA. HERRICK & CO., Jackson, Mich., have added the above article to their line of Brackets for garden tools. The Bracket, as shown in the illustration, is used in



New Rake Bracket.

connection with those for Forks and Shovels, recently described in *The Iron Age*. The Rake Bracket fits the same wall plate as the others, and is interchangeable with them, and projects the same distance from the wall as the former ones. The Bracket accommodates ten Rakes.

Prize Competitions

\$25.00.

Prize Competition No. 25.

SUBJECT:

Show-Window Display.

The subject of attractive show-window display is one requiring careful attention as an inexpensive and sure method of attracting and securing trade. This competition is designed to draw out suggestions as to the best methods of displaying goods, which may, if desirable, be illustrated by sketches and photographs. Prominent among the points which may be touched upon are the following:

1. The object of window display;
2. How this object may best be accomplished;
3. Kinds of goods especially suitable for window display;
4. The frequency with which displays should be changed;
5. Treatment of season goods;
6. To what extent goods in operation may be shown;
7. Suggestions for special and unique designs;
8. Arrangement of stands, shelving, &c., in windows;

9. Errors to be avoided in window display.

This competition will remain open until June 24, 1893.

The following prizes will be awarded:

First prize.....	\$12.50
Second prize.....	7.50
Third prize.....	5.00

The prizes will be awarded for answers which, in the judgment of the Committee of Award, are most suitable for publication and of the most general interest

We reserve the privilege of extending the time on any competition in case the contributions received are not of sufficient number or merit for the committee to award prizes. These competitions are open to every one, and it is hoped that there will be a general response from business men. We shall have the privilege of publishing any or all of the contributions received.

Replies are to be received not later than June 24, 1893. They should be addressed as follows:

DAVID WILLIAMS,
96-102 Reade street,
New York.

Prize Competition No. 25.

The Competitions which have closed are now in the hands of the Committees of Award, who are giving careful attention to the claims of the different contributions. From the number of these and the evident merit of not a few of them, we are assured that a great deal of valuable information and suggestion will be put at the disposal of the trade.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 23. Closing May 27.

Three or more Subjects for Prize Competition.

No. 24. Closing June 3.

Short Methods of Figuring Discounts.

No. 20. (Reopened.) Closing June 10.

A Reliable System for Securing the Correct Charging of All Goods Sold on Credit.

No. 25. Closing June 24.

Show-Window Display.

Another subject will be announced in our next issue.

Ornamental Iron Work.

THE SNEAD & CO. IRON WORKS, Louisville, Ky., and Chicago, Ill., have issued 22 plates handsomely illustrating ornamental iron work, showing what the company have done and what they are prepared to do in that line. The illustrations are of artistic stair railings, grille work, bank railings, doors and arches, gates, arched doors, winding stairs, andirons, hinges, &c. The plates are bound in book form. The company state that they are prepared to make the finest castings and to do the best forged work, to finish by electro plating or by either of the rustless processes, to execute examples in galvanoplastic and to furnish designs when required. A separate catalogue is devoted to book stack and shelving for libraries, of which they are making a specialty.

All the parts of this work, including the shelves, are of iron, thus constructing, it is stated, a library entirely fire-proof and rendering valuable works safe almost beyond peradventure.

Simplifying the Hardware Business.

THIS FOLLOWING COMMUNICATION from a prominent Hardware merchant of Vermont will be read with especial interest, relating as it does to the tendency toward simplifying Hardware prices in such a way that they are more readily kept track of. The disadvantages of this are forcibly pointed out by our correspondent:

I notice editorial in issue April 27 "Sacrificing Bar-Iron Extras." It advocates a line of action which in these years is getting quite too general in all lines of the Hardware trade, and may be summed up by saying, "Tell all you know." Turn over a few pages of the same issue, and you are publishing the complaints of the retail men in Illinois because the dry goods men are using Hardware articles for leaders. Now, what makes it possible for these men, knowing nothing about the business, to jump in and buy leading articles as low as a regular dealer? One, and one of the most pronounced and prominent reasons why, is because it has been the aim of manufacturers and jobbers to simplify everything, making uniform lists and discounts, and, in short, making it all so easy that he who runs may read. You talk about lack of time and finding it confusing. There is time for all things, and the expert Hardwareman who has spent the years so far allotted to him has no such word in his lexicon as "confusion."

The man that to-day complains that he cannot understand the market situation because the Bar Iron and Steel cards are not blazoned on the blue firmament in letters of fire with footnotes has mistaken his calling. Give him a pick, shovel or buck saw and let his weary brain rest. If the dry goods merchant, the groceryman, the gentleman loafer, thinks it is muddling to his brains, let him keep to his tapes and textiles, liquids and solids and to the vocation allotted to all loafers—the duty of attending to the business of the entire community. The man who is engaged in dispensing Bar Iron and Locks needs naught of them.

You admit that the jobber is the gainer, and it is true. It also helps the retailer, and they both need this aid. Then who is calling for a new card? It must be the man I have described above. Eliminate the man with the tired brain, and let well enough alone.

The recent agitation of the question of a new Cut-Nail card is exactly in this line. It was better before it was touched. Some one asks Why? Because the evil (which I do not admit was or is an evil, but it was so called), viz., selling a purchaser the goods he wanted to buy, based on the average extras per keg, is not out of use, but goes on just the same.

I am aware I am giving you a chestnut in this last statement.

Price-Lists, Circulars, &c.

E. C. ATKINS & Co., Indianapolis, Ind.: Saws, Saw Tools and Mill Specialties. An illustrated catalogue and price-list of 88 pages gives the present list prices of their goods. The manufacturers state that their increased business has made it necessary for them to establish branch houses at Memphis, Minneapolis and Chattanooga, to accommodate customers at these points. With each branch is a repair department equipped with Appliances and Tools.

STANDARD TOOL COMPANY, Athol Machine Company, selling agents, Athol, Mass.: Mechanics' Fine Tools. Instruments for accurate measurements a specialty. An illustrated price-list describes Try and Center Squares, Bevels, Screw Pitch and Center Gauges, Depth Gauges, Combination Pliers, Surface Gauges, Bevel Protractors, Open-Face Caliper Gauges, Beam Micrometer, Calipers, Steel Rules, Iron Levels, &c.

J. J. SPILKER MFG. COMPANY, Cincinnati, Ohio: New Improved Excelsior Miter Box. The Tool is described in an illustrated circular as designed to meet the demand for an accurate and at the same time low priced, Miter Box. It is recommended by the makers for the use of carpenters, builders, cabinet and picture frame workers, showcase, car builders and joiners in general.

WADDEL WOODEN WARE WORKS, Greenfield, Ohio: Ideal Coffee Mills. On the front cover of their first catalogue is the following: "New goods made by a new company. Coffee Mills that will grind; are the latest, neatest and best." The different styles of Mills shown are known as A 1, A 2, A 3, A 4, A 5, A 6 and A 7. The Mills are guaranteed by the makers to grind fast, to have good adjustments and to be well finished.

BEVIN, BROS. MFG. COMPANY, East Hampton, Conn.: Hand and Call Bells and Cycle Sundries. A separate illustrated catalogue and price-list is devoted to these goods; one includes Hand Bells, Swiss Hand Bells, School Bells, Call Bells, Tea Bells, &c. The Cycle Sundries illustrated in the catalogue relating to these goods are the following Bicycle Bells: Harrison Alarm, Single Stroke, London Chime, Electric Stroke Ratchet, Double Stroke, Electric Stroke Rotary, and New Double Stroke Bell. Trouser Guards and the Stay There Nipple Grip are also shown.

CONCORD FOUNDRY COMPANY, Concord, N. H., Brass and Iron Founders: Concord Sewer Inlet Gratings and Traps, Sink Traps, Slop Hoppers, Sanitary Traps, &c. Their illustrated catalogue and price-list shows Fountains, Builders' Materials, Stable Fittings, Railroad Castings, Machinists' Supplies, Chimney Caps, &c.

THE J. D. SMITH FOUNDRY SUPPLY COMPANY, Cincinnati, Ohio: Supplementary catalogue No. 16. This illustrates, with prices, Molders' Trowels and Tools in a large variety of forms; Mallets, Gate Spools, Reflecting Glass, Bench Rammers, Brushes, &c. Separate sheets are devoted to Exhaust Tumbling Barrels and Radiant Facings.

THOMAS CARLIN'S SONS, Allegheny, Pa.: City, Park and Sewer Castings, Road Rollers, Crushers, &c. Their F

catalogue has been issued, the manufacturers state, in answer to the demand for better roads and roadways, showing their complete line of Sewer Castings, Gutter Crossings, &c., together with a partial list of Road Rollers, Crushers and Contractors' Tools.

H. D. SMITH & Co., Plantsville, Conn.: Carriage, Wagon and Sleigh forgings. Their catalogue under date of May 1, 1893, of 180 pages, is indexed through giving the names of articles found on pages. An alphabetical index also given aids in ready reference to the various styles of the different lines of goods. The catalogue illustrates goods of their own make only, and contains a large variety of Carriage, Coach, Wagon and Sleigh forgings. Bicycle and Special forgings are made to order.

S. D. KIMBARK, Chicago, Ill.: Confidential Quotations. Their pocket size price-list, under date of May, 1893, is offered as a complete list of their stock, and is a compact and handy book of reference, valuable alike as a market report for the general information it contains, and as a guide to the cost of the material sold by them entering into the construction of any work. Illustrations of goods listed are given in outline cuts, thus aiding in the selection of articles best suited to requirements. An exhibit of the products of their factory, including Bodies, Seats and Spokes, will be located in Transportation Building, Vehicle Division, Section A, Block II, World's Columbian Exposition.

ELECTRIC GAS LIGHTING COMPANY, Boston, Mass.: Illustrated catalogue and price-list K, under date May, 1893. This, their tenth annual catalogue, is devoted to Electrical House, Hotel, Church, Theater and Office Furnishings, including Call Bells, Announciators, Electric Gas-Lighting Apparatus, Frictional Lighting Goods, Electro-Mechanical Gongs, Electric Door Locks and Openers, Cut-Outs, small Electric Motors, Batteries and Battery Materials, &c. The catalogue contains 72 pages, fully illustrated, in connection with which are descriptions and price-lists. The company are also manufacturers' agents for Electrical Supplies.

SEYMOUR SMITH & SONS, Oakville, Conn.: Hardware. Their catalogue and price-list illustrates Pruning Shears, Bouquet Clipper, Orange Picking Shear, Tree Pruners, Bull Rings, Bull Snaps, Cattle Leaders, Saw Sets, Bench Hooks, Spoke Shaves, Breast Drills, Carpet Stretchers, &c.

LEGGETT & BROTHER, New York: Leggett's Paris Green or Dry Powder Gun. An illustrated circular describes this Gun, which is designed for distributing dry insecticides. The Gun has a reservoir which holds 4½ pounds of paris green, with a fan in the butt, which, as it is revolved, distributes the powder through a tube.

HENRY B. NEWHALL COMPANY, New York: Coil and Cable Chains and Stud Link Cable Chain. As general agents for manufacturers they make the following qualities of Close-Link Chain: Proof Coil or Cable, B. B. Crane, B. B. Crane. They also make a special quality of Steel Chain, Ships' Cables, Marine Railway Chain, Dredge, Boom, Pitch, Conveyor, Dimension Chains, and special Chains of any kind made to order. The circular illustrates the Chain-testing machine used at the works, with a table of weights, tests and breakage strains.

H. S. OWEN MFG. COMPANY, Washington, D. C.: Capital Cycles. The company issue a handsomely illustrated souvenir of the National Capital, giving views and descriptions of the Government buildings, private residences, buildings of foreign legations, street views, &c. A modest portion of the book is devoted to the Capital Cycles, of which they are manufacturers.

PAGE BELTING COMPANY, New York: Leather and Rubber Belting, and Mechanical Rubber goods, Lace Leather, Mill Supplies, &c. Their illustrated catalogue and price-list relates to these goods and contains practical rules for the purchase and use of belting; also information about kinds and grades of belting to be used for different kinds of work. A number of pages near the back of the book contain their telegraph cipher code.

WM. WILCOX MFG. COMPANY, Middletown, Conn.: Wrought-Iron Padlocks, Nos. 3073 to 3080 inclusive; also No. 138 Bronze Metal Padlock, engraved, with flat steel key. The latter is referred to by the manufacturers as being neat, tasty and handsomely engraved, with inside works all brass, thus making the entire lock rust proof. Circular sheets illustrate these goods with prices.

It Is Reported—

That the Hardware firm of Laing & Andrews, Salamanca, N. Y., has dissolved. S. S. Laing retires and J. A. Andrews will continue the business with his son, Herbert Andrews.

That Weeks & Wendt's Hardware store at Elizabethton, Tenn., was destroyed by fire on the 8th inst.

That Waldo G. Brown, dealer in Hardware, Houlton, Maine, has sold out to John Watson.

That Calvin Rogers has purchased the Stove store of Johnson Bros., Bath, Maine.

That the Hardware store of Campbell & Davis, Rockport, Mo., was destroyed by fire on the 2d inst. Loss, \$6000; insurance, \$3000.

That the Edwards & Chamberlain Hardware Company have been organized at Kalamazoo, Mich., to carry on the business of the late Chas. H. Dickinson. The capital stock of the company is \$40,000. The officers are as follows: C. M. Chamberlain, president; H. B. Peck, vice-president, and A. K. Edwards, secretary and treasurer.

That Read & Avis' Hardware store Vineland, N. J., was burglarized on the 4th inst.; \$60 worth of goods were stolen.

That Bunn & Feery, Hardware, Stove and Tinware dealers, Messina, Cal., are out of business.

That the firm of Oder & Miller, Marion, Ind., have dissolved. Mr. Miller has purchased the Hardware and Implement branch, while Mr. Oder retains the Carriage and Buggy department.

That the large Hardware establishment of Storrs, Chatfield & Co., Owego, N. Y., was seriously damaged by fire on the 9th inst. The fire originated in a shop on the third floor, and the third and fourth floors were completely gutted before it could be extinguished. The stock on the first and second floors was seriously injured by water and the falling of the upper floors. The firm carried about \$27,000 worth of stock, on which there was an insurance of about \$20,000. The precise loss cannot as yet be computed.

That Smith Bros. have opened a Stove and Tin store at Leominster, Mass.

That B. W. Heinzelman has recently entered the Hardware, Stove and Tin business at Chicago.

That Chas. N. Scott, who has been engaged in the Tin and Hardware business for a number of years with Chas. B. Churchill, at Woodstock, N. B., has fallen heir to a valuable farm and retired from the firm.

That G. C. Culver, dealer in Hardware and Stoves, Huron, S. D., has been succeeded by Culver & Smith.

That a large building, 20 x 55 feet, can be secured at Foster, Iowa, by any party who will put in a stock of Hardware. That business is unrepresented in Foster.

That O. H. Russell's Hardware store at Petersburg, Ohio, was burglarized recently.

That J. G. Boyd, Irwin, Pa., is disposing of his Hardware business.

That the contract for rebuilding J. B. Shannon's Hardware store on Market street, Philadelphia recently almost destroyed by fire, has been awarded to James Johnston. The repairs will cost in the neighborhood of \$10,000.

That Kirby & Miller, dealers in Hardware, Gresham, Neb., have dissolved. T. J. Kirby will continue the business.

That C. J. Hulquist, dealer in Hardware, Holdrege, Neb., has been succeeded by Klunniger & Kelly.

That Longquist & Shepherd succeed Shepherd & Smith, Hardware dealers at Cumberland, Wis.

That J. D. Shuart is the successor of Shuart Bros., Hardware and Implement dealers, Belfast, N. Y.

That the contract for furnishing the Builders' Hardware for the new Sentinel Building at Milwaukee, Wis., has been awarded to Hardware merchant Philip Gross.

That Post & Mills, Hardware merchants, Cheboygan, Mich., have sold out to J. J. Post.

That N. Sargent & Co., dealers in Hardware, Fonda, Iowa, have sold out.

That John P. Lowell's Stove and Tin store, at Biddeford, Me., was destroyed by fire on the 11th inst. His stock, valued at \$2500, was almost totally destroyed. The insurance is \$1400.

That B. Hays & Son, Hardware merchants, Beloit, Kan., are intending to open a store at Effingham.

That S. B. Riggs & Sons' Hardware store at Clyde, Kan., was entered by burglars on the 10th inst. and a large quantity of Revolvers and Pocket Knives was stolen.

That Nelson Bingham, formerly in the Hardware business at Pierpont, S. D., has sold out.

That E. C. Minas, Hardware merchant at Hammond, Ind., is erecting a block 50 x 100 feet, three stories high. It will have a stone front and will be equipped with an elevator. The largest plate glass windows in town will attract passers-by. The entire first floor of the building will be occupied as a salesroom. The third floor will be used as a wareroom and the second floor will be divided into four six-room flats.

That the Hardware store of Stouffer & Co., Brighton, Col., was burglarized on the 11th inst. Cutlery and Plated Ware comprised the booty.

That the Hardware firm of Boston & McMinnin, Bently, Ill., have decided

to move their business to Stronghurst. The change will be made in July.

That Lamson & Stimpson have opened a new Hardware store at Thomaston, Maine.

That thieves entered the Hardware store of J. C. Koelsch, Menasha, Wis., on the 14th inst., and got away with about \$100 worth of Pocket Knives, Revolvers, Razors, &c.

That H. S. Graham, Delhi, N. Y., will, during the coming season, build an addition to his Hardware store to accommodate his increasing business.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

There has been a good steady movement in the lines of Paints and Colors employed in outdoor work, and, according to current report, the distribution has exceeded that of any preceding week since the opening of the spring season. In various specialties used by car and wagon builders and in other high-class work there has also been a very good business, while ordinary ready-mixed and mineral Paints have enjoyed fully the average sale. Neither manufacturers nor jobbers have experienced any difficulty in filling orders promptly, however, and that and other circumstances go to show that imperative wants have governed purchases in a great degree. There have been no disturbing features, speculative or otherwise, and prices therefore show merely ordinary variation.

White Lead.—The late unenviable experience of certain industrial combinations, particularly Cordage and Distillers, keeps rumor busy with the affairs of the National Lead Company, and thus indirectly bears upon the market for the corrodors' leading product. But rumor and actual market conditions fail to connect. The combined corrodors are carrying on their business in the usual way and maintaining list prices in this city and immediate vicinity. The "outside" corrodors seem to be doing likewise, and evidence is wanting of anything more than ordinary experience in Quick-Process and Mixed Leads. In the jobbing branch of the trade there is likewise an absence of anything radically different from what has been common for some time past.

Red Lead and Litharge.—For these there has been about the regular season movement, and the market is wholly bare of any distinctly new feature. The old list prices for domestic product prevail, and fluctuation in foreign kinds is measured by a small fraction.

Zincs.—The unsettled condition of the market for crude material is without pronounced effect upon the market. For domestic Oxide, low grade product may be secured occasionally at a special rate, but, taken as a whole, the old list is well adhered to and the movement from first hands on old and new orders continues quite liberal. Foreign Zincs are moving out in moderate quantities only, but the several brands realize former prices.

Colors.—Prices for the more staple lines of dry Colors remain very steady and the volume of business is fully up to the average for the season. The same remark will apply to high-grade Oil Colors. There is the usual irregularity in cheaper varieties, however, and some unevenness in ready-mixed Paints. As a whole the distribution is of good volume and better, if anything, than it was earlier in the month.

Miscellaneous.—Recent arrivals of Block Chalk have been about all absorbed and the market remains steady in the absence of more urgent offering for future arrival. Whiting, Paris White and Putty are faring well as far as movement is concerned and show very little change in price. Barytes and the general line of clays find fair movement and show little change in value.

Oils and Turpentine.

Large transactions that figured with more or less prominence in some few departments during the fortnight preceding the period under review have failed of duplication during the past week. As a matter of fact, business has been of routine character nearly all along the line, and the general demand at present is routine in all that the term implies. Here and there may be found signs of a slight softness to values, but the actual changes during the week are within very narrow bounds. Nothing has occurred in the markets for raw materials or in other conditions that would tend to change the complexion of affairs radically.

Linseed.—Western mills are gradually being shut down for the annual summer vacation, as it is popularly termed, and out-of-town offerings of Oil in this market are correspondingly smaller. City crushers experience no difficulty in promptly filling all orders that come along, however, and could doubtless accommodate a larger run of custom. Possibly some "outside" Oil could be secured at 49¢ or a shade less, but crushers adhere firmly to 50¢ for city brands, and report a good seasonalable distribution.

Cotton-Seed Oil.—Dealings have been on a smaller scale. Exporters have manifested no interest to speak of, and large home consumers have withdrawn for the time being at least. This seems to have somewhat affected the nerves of a few holders and led to slight shading of former prices in a few instances, but there are no signs of general anxiety to sell or apprehension as to the future of the market. Business the past week has been chiefly at 47¢ @ 48¢ for prime quality crude Oil, 50¢ @ 51¢ for prime Summer Yellow, and 52¢ @ 53¢ for prime Summer White.

Lard Oil.—Between routine sales to the home trade and some few purchases for export account a very good business has been effected. Manufacturers adhere to the policy of producing Oil only as actual requirements dictate and there is therefore little, if any, accumulation. Prices are held very firmly, as a matter of course, particularly for high-grade goods.

Fish Oils.—Nothing new has developed in the situation of the market for crude Sperm or crude Whale Oil, and Menhaden is practically neglected pending the initial results of the new season's catch. The refined products are selling at about former prices, but in very moderate quantities only. Cod Oils firm in price, but quiet.

Miscellaneous.—The market for common Olive Oil in barrels is rather weak, owing to somewhat anxious offering. Ordinary parcels may be secured at 58¢ @ 60¢ on the spot, and 57¢ or less will buy round lots to arrive. Cocoanut Oils have undergone no change, and price and the business passing are of very ordinary character, while demand runs light. Red Oils are still rather weak, but showing no radical change. Neatsfoot Oil is steady at old prices, with about the usual jobbing movement.

Spirits Turpentine.—The market has been a shade weaker, with sales at down to 29½¢ for regular and 30¢ for machine barrels. There are no distinctly new features. The softness in prices is due almost wholly to rather slow condition of trade at this point.

The Blount Door Check and Spring.

E. J. Hussey & Co., 80 John street, New York, as agents for Blount Mfg. Company, Boston, are offering the above article, as shown in the accompanying cuts. It consists of an upright and a horizontal cylinder cast in one piece. The spring is contained in the upright cylinder and the checking device in the horizontal cylinder, the connection be-

other end. The door is checked when closing by the liquid passing through the valve in the end of the piston down through a perpendicular hole in the right-hand end nut and back into the piston at its under side. The flow of the glycerine is regulated by the thumb nut at the right-hand end of the horizontal cylinder, allowing the door to close slowly or rapidly as desired. The parts are all interchangeable, and can

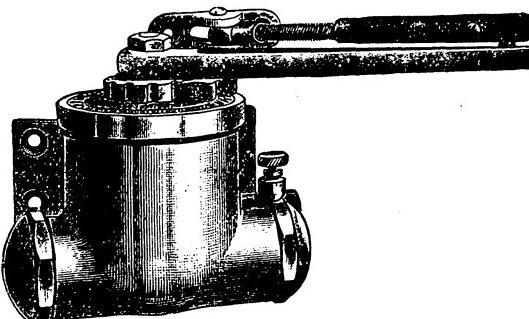


Fig. 1.—The Blount Door Check and Spring.

tween the two cylinders being entirely cut off by a plate. The actuating power in the upright cylinder is a clock spring, in size proportionate to the requirements, those for large doors being wider and heavier than for smaller ones. The outer end of the spring is held in a slot at the back of the upper cylinder, and the inner end of the spring is interlocked in a sleeve which slips over the upright bar. The sleeve at the top has a notched wheel in which the pawl attached to the under side of the jointed arm catches. The desired tension is given to the spring by winding up the notched wheel by the aid of a wrench,

readily be taken from the case. There is practically no loss by use of the glycerine, and the original charge is designed to last for years. The manner of attaching the device is shown in Fig. 2, and can be adapted to right or left hand door by reversing the spring. The device is also made for attaching to the under side of the casing when it is to be put on the opposite side of the door from that shown in Fig. 2. Every check is warranted by the manufacturers, and the device is being favorably received for use by corporations and in public and private buildings. The check is made in five sizes, for use on inside

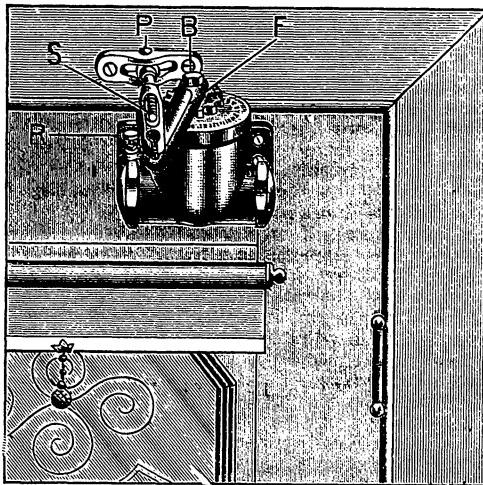


Fig. 2.—Blount Door Check Attached.

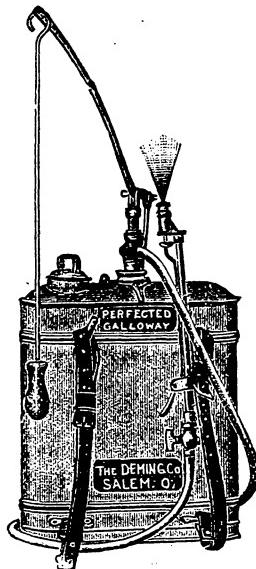
after which the pawl is dropped into a notch to hold it. The arm has ball joints to avoid friction at the plate that fastens on the casing, also at the other end. The bar, which is rigidly secured to the arm over the notched wheel, runs down through the sleeve, the center of the spring and the hole in the plate, and is attached to a piston in the horizontal cylinder by a connecting link which works the piston back and forth. The material for checking the door when closing is glycerine, which is prevented from going up into the upright cylinder by packing around the bar. The piston is open at the left-hand end of the horizontal cylinder, Fig. 1, and is provided with a hinged valve at the

doors to doors of the largest dimensions.

The Perfected Galloway Knapsack Sprayer.

The Knapsack Sprayer, herewith shown, and offered by the Deming Company, Salem, Ohio, consists of a copper tank arranged to strap on the back and a brass pump operated by a rod attached to the lever. The pump is described as being so constructed that all leakage from the stuffing box will drip back into the tank; also that, if it becomes necessary, the entire pump can be taken out for repairs without

the least trouble. The pump, it is remarked, is fastened firmly in the tank, and, being placed in the center of the same, is supported by the central brass casting, admitting of its use for either right or left hand without shifting the position of the straps. A strainer is

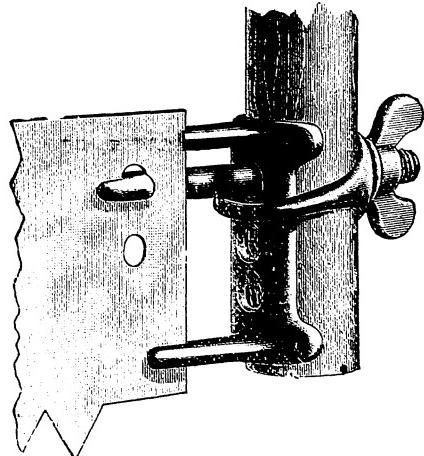


The Perfected Galloway Knapsack Sprayer.

arranged at the top of the tank to prevent any deleterious material from entering the tank and pump, and the discharge is provided with six feet of $\frac{1}{4}$ -inch rubber tubing; also with the Deming improved spray nozzle, with lance and degorger. This nozzle is referred to as making a fine, mist-like spray. The device is designed for use by grape growers, florists, gardeners, &c., for spraying grape vines, potato plants and small orchards, where the work is necessarily done by one man.

Sensible Saw Handle.

The saw handle herewith illustrated is being introduced by the Gwinner Mfg. Company, Hamilton, Ohio. The



Sensible Saw Handle.

handles are described as made of second-growth timber and mounted with malleable-iron attachments. The arms on the reversible plate form abutments for the end of the saw. One side of each arm rests against opposite sides of the saw to keep the handle in line, the other side being short to facilitate attaching or detaching the handle. It

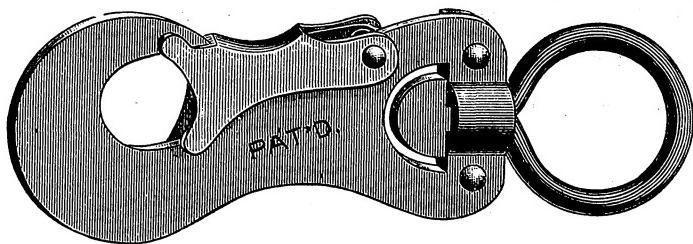
is explained that either of the holes in the saw may be used by inserting the bolt through a corresponding hole in the plate, and that the bolt pin extends through the hole in the saw by a double bend and cannot slip out. A ring on the washer encircles the handle to keep the plate in place. The manufacturers claim that the handle adds to the length of the saw; that it is quickly attached or detached; that it provides a space for the hand between the handle and the saw, and that the parts are retained in place when the handle is detached.

Eureka Trammel Points.

W. M. Morton & Co., New Haven, Conn., for whom C. E. Jennings & Co., 79 Reade street, New York, are agents, are putting the above goods on the market, as illustrated herewith

Steel Harness Snap.
Kelley & Woolworth, Niagara Falls, N. Y., are introducing the snap here-

firmer over the outlet in the lid and the lid lowered until sufficient oil is poured, when the finger over the outlet is removed. Should there be too much oil



Steel Harness Snap.

with shown. It is made of sheet steel and has a swivel ring; with the spring constructed in such a manner, it is stated, that it is practically non-breakable. Its

in the lamp—that is, above the end of the spout in the lamp, it is explained that the surplus oil will be drawn back into the can when the finger is removed

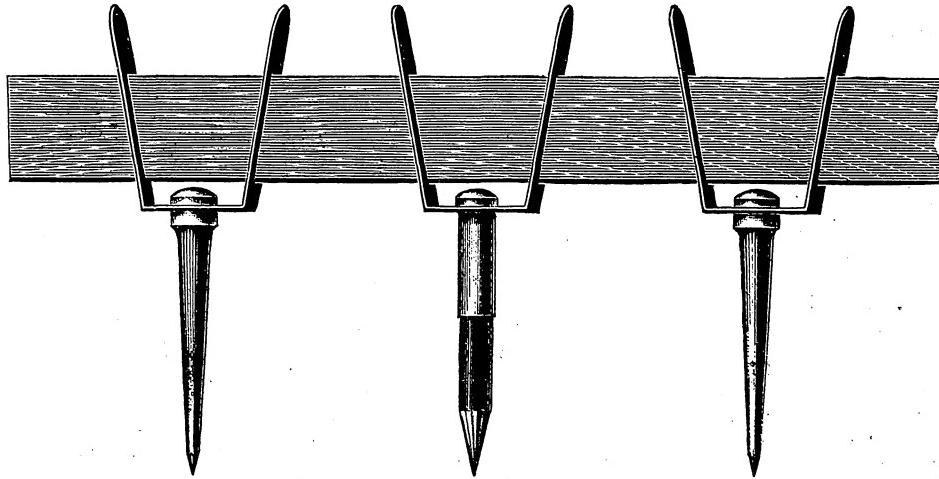


Fig. 1.—Eureka Trammel Points.

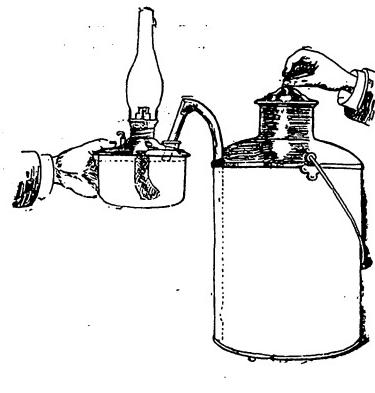
The points are packed in sets as shown in the full-sized cut, Fig. 1, consisting of two points and one pencil with holder. The points are made of spring steel with sharp points, all nickel plated. The advantages claimed for them by the manufacturers are: That they are instantly adjusted; that they are self-clamping; that when set there is no dodging; that they have no loose pieces, such as screws, &c., to lose, and that the pencil and points

low price is also referred to as a feature recommending the snap.

Self-Pouring Oil Can.

The Self-Pouring Oil Company, 1430 South Penn square, Philadelphia, Pa., are putting on the market the can illustrated herewith. The can is made with

from the outlet. In pouring oil it is not necessary to lift the can. The manufacturers claim that a drop or lamp full of oil can be poured; that every drop can be poured from the can; that the spout cannot stop up, and that the oil is under control in pushing it forward



Self-Pouring Oil Can.

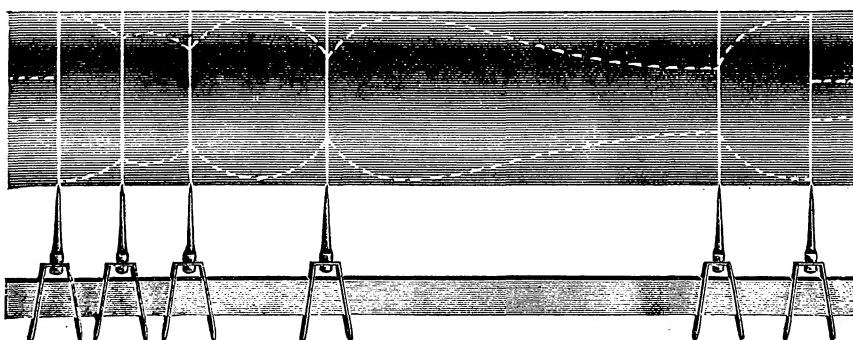


Fig. 2.—Points Used as a Lathe Marker.

are always ready for use. The point is made that for transferring measurements the tool is useful, being quicker and more accurate than a graduated rule, at the same time doing its own scratching. By placing the desired number of points on a bar, as in Fig. 2, the tool may be used as an adjustable marker for various kinds of lathe work. Points for this use are listed by the dozen.

the breast and neck stamped from one piece, and with a curved spout, which is straight inside the can and reaches to the bottom. The lid, which closely fits inside the neck, is 5 inches long, stamped from brass, having a brass knob with a hole in its top forming an outlet to the lid. In operation the lid is raised by taking hold of the knob with the thumb and second finger; when raised sufficiently, the first finger is placed

into the lamp, drawing it back into the can, if desired, or stopping it instantly; also, that all the oil in a lamp can be drawn into the can. The point is made that the can is made with the finish and care so that it may be used in the dining room or library, and for handsome lamps which it is not desirable to take to the kitchen to be filled. The can is made without springs or packing, and to hold one gallon of oil.

The Crystal Valve Oil Can.

The accompanying cuts show the construction of an oil can being put upon the market by the Star Mfg. Company, Canton, Ohio. The can, Fig. 1, is described as consisting of a fine crystal glass reservoir of new and symmetrical pattern, protected with substantial metallic top and bottom bands, the

to lease the entire building at 149 in the same street. The new quarters consist of seven floors about 65 x 25 feet. He deals largely in job and auction lots of Hardware, House Furnishing Goods, &c., as well as regular goods, and manufacturers overstocked in some lines find it advantageous thus to dispose of their surplus without de-

gle; also that the two bars running back from the head are an equal distance apart at all points from a center line drawn from the rear hub to the center of the head. The point is made that by this design the weight of the rider and the strains upon the machine are equally distributed between the

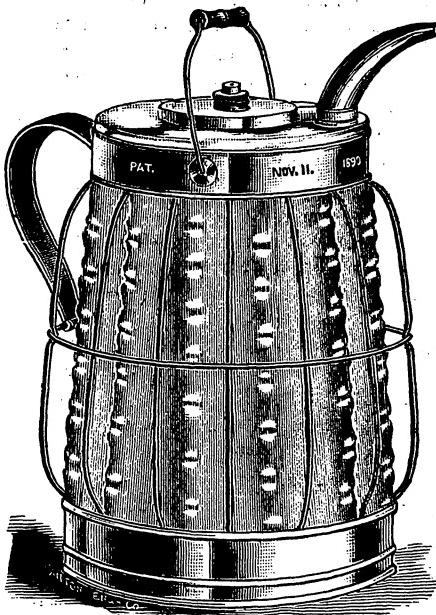


Fig. 1.—The Crystal Valve Oil Can.

bottom one having a flange extending far enough under the glass to protect it from injury, while the whole is bound together with a wire frame. It is pointed out that the handle is so adjusted as to nicely balance the can, and at the same time to admit of its being easily tipped for filling the lamp. The valves shown in Figs. 2 and 3 are referred to as especial novel features. When the can stands vertically the valves, it is stated,

moralizing their regular trade. This business was started in a small way about nine years ago at 576 Grand street. After remaining there three years Mr. Weiland located at 109 Bowery, but outgrowing the facilities there in three years he rented the premises at 148 Chambers street, where he has since been about the same length of time. It is his intention to add new lines of goods to those already dealt in, as he will soon be in a position to store larger stocks.

The Triangle.

The Peerless Mfg. Company, Cleveland, Ohio, are offering the bicycle as

different parts of the frame, thus securing strength. The material used is English steel tubing and drop forgings. The specifications include: 28-inch wheels, with a 45 inch wheel base, Burris-Michelin French tire or the New York Belting and Packing Company's

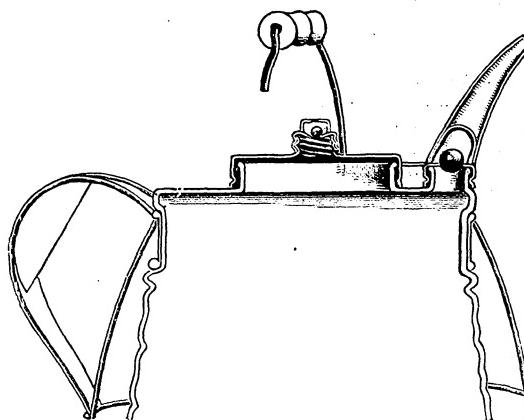


Fig. 2.—Valves Closed.

automatically close the vent at the top and the spout, rendering both perfectly air tight, as in Fig. 2. It is further stated that when the can is tipped to pour oil, as in Fig. 3, the valves open, thus obviating the necessity of a cap on the spout to prevent evaporation, as well as the unscrewing the can top to give the can vent.

CHARLES WEILAND, now occupying 148 Chambers street, has been compelled, by the growth of his business,

shown in Fig. 1. The distinctive feature of the machine, and from which is derived its name, is stated to be the symmetrical design of the frame, combining maximum strength, minimum weight and beauty of contour. The triangle represented by the dotted lines in Fig. 2 serves to show the basis upon which the form of the frame was worked out, and also its proportions. It is remarked that the outline forms a perfect triangle, and that the rear portion under the saddle is an equilateral trian-

tire; all bearings tempered and ground and supplied with balls; either rat-trap or rubber pedals; 10-inch steering head; Garford saddles; gentleman's light roadster pattern furnished unless other

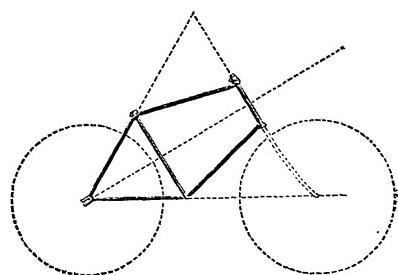
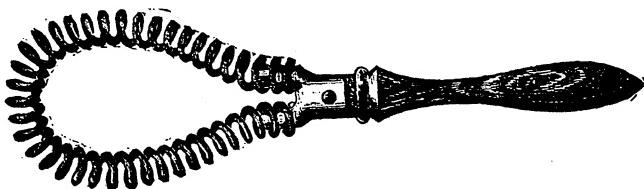


Fig. 2.—The Triangle Frame.

style ordered; combination cork and rubber handle; Hercules $\frac{1}{2}$ inch chain; machine geared to 64, but can be changed to 56 by altering the gear wheel on the rear hub. The manufacturers state that the finish of their machines is of the highest order, and that a large amount of nickel plating about the head and sprocket wheel gives the wheel a fine appearance.

Boss Dust Beater.

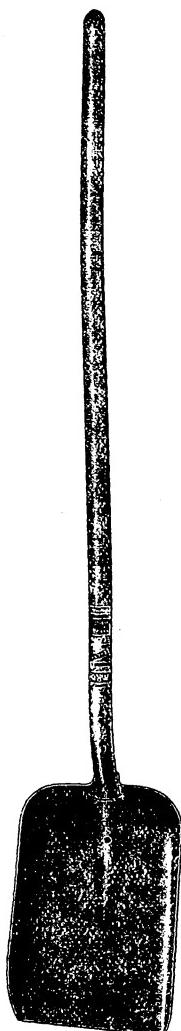
The accompanying cut represents a dust beater manufactured by Peabody & Parks, Troy, N. Y. It is composed of a coil of steel wire secured in a galvanized malleable iron socket which is attached to an enameled wooden handle. The wire coil, including the socket, is 10½ inches long, the handle 11 inches

*Boss Dust Beater.*

in length, making the beater 21½ inches over all. It is designed to remove dust and filth from clothing, upholstered furniture, rugs and carpets. The manufacturers claim the beater will raise the nap, thus improving the appearance, also that it will not leave marks or tear the fabric.

Economy Shovel.

A. M. Ross & Co., Ilion, N. Y., is offering the shovel illustrated herewith. The shovel is made to meet the demand

*Economy Shovel.*

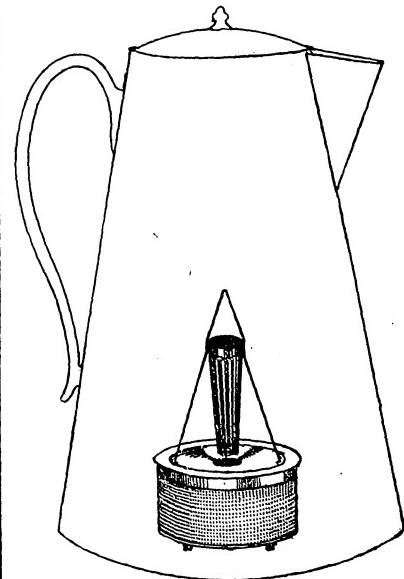
for a narrow bowl scoop shovel, with long handle, 4½ feet, nearly on a straight line with the bottom of the bowl. The shovel is recommended for feeding coal in furnaces, boilers, &c., and for taking

ashes from pits. It is referred to as being useful for a variety of work, being light, strong, serviceable and cheap.

Ideal Coffee Purifier.

Donathen Novelty Mfg. Company, 510 Broadway, Kansas City, Mo., are introducing the coffee purifier herewith shown. In operation the coffee is

made in the usual way, by boiling, but one or two minutes before taking the coffee off the stove, while it is yet boiling, the purifier is dropped into the coffee pot. In a minute or two it is lifted out, when, it is stated, all the

*Ideal Coffee Purifier.*

sediment will be found in the perforated tin box. The manufacturers claim that this device will enable any one with a common coffee pot or a tin pail to make as good coffee as could be made with the more complicated and expensive pouring coffee pots. The purifier is made in two sizes: No. 1 for 2 to 4 quart pots, and No. 2 for 4 to 6 quart pots.

That the manufacturers of the valleys will insist on marked reductions not only in puddling, but in the pay of rollers, heaters and roughers, is evident from the comments thus far made by individual mill proprietors. It is argued that \$3.75 puddling rate at Harrisburg and the \$3.50 rate farther East put the Western Pennsylvania mills at a disadvantage which they will not stand for another year. It is intimated that the Western Iron Association's card rate of prices for bar iron may not be used as the basis of the scale, since the fiction of 2-cent bar iron has never had more emphasis than within the past year. A general readjustment of the scale is proposed, and reductions of 15, 25, 40 and even 50 per cent. in different classes of work are talked of, in view of the large improvements in machinery and the ore.

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Current Hardware Prices.

MAY 24, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5% signifies that the goods in question are sold at prices ranging from discount 50 and 10% to discount 50 and 10 and 5%.

Adjusters, Blind—

Domestic..... \$ per doz \$3.00, 33%
Excelsior..... \$ per doz \$1.00..... 50&10&5%
North's..... list net @ 10%
Zimmerman's—See Fasteners, Blind.

Ammunition—See Caps, Cartridges, Shells, &c.**Anvils—**

Eagle Anvils, # D 9¢..... 15@15&5%
Peter Wright's..... 11@11&5%
Armitage's Mowle Hole..... 10@11&5%
Am. Wrought, Horseshoe brand..... 11@11&5%
Trenton..... 10@10&5%
Wilkinson's..... 10@11&5%
Barney Mfg. Co..... 33%
Anvils

Anvill Vise and Drill—

Millers Falls Co., \$18.00..... 20%
Cheney Anvil and Vise..... 40&10%
Allen Anvil and Vise \$3.00..... 40&10%
star..... 45&5%

Apple Parers—See Parers

Apple, &c.

Augers and Bits—

Common Augers and Bits..... 70%
Boring Machine Augers..... 70%
Car Bits, 12-in. twist..... 60%
Russell Jennings Augers and Bits 35&5%
Jennings Pattern Car Bits..... 40%
Jennings Pattern Auger Bits..... 60%
Snell's Bits..... 60&5%
C. E. Jennings & Co., No. 10, extension..... 40%
Ip. Jennings & Co., No. 30..... 60%
C. E. Jennings & Co., Auger Bits, # set, 52¢
Screw Drivers, No. 5, \$5. No. 30, \$3.50, 25¢
Lewis' Patented Single twist..... 45%
Fugles' Pattern..... 30%
Hugh's Jennings Pattern..... 15&10%
L'Hommiedieu Car Bits..... 30&10%
Forster Pat. Auger Bits..... 15%
Cincinnati Bell-Hangers' Bits..... 30&10%
Blk Stock Drills—

Morse Twist Drills..... 50&10&5%
Standard..... 50&10&5%
Cleveland..... 50&10&5%
Syracuse, for metal..... 50&10%
Syracuse, for wood (wood list) 30&30&5%
Cincinnati, for wood..... 30&10%
Cincinnati, for metal..... 45&10%
Expansive Bits—

Clark's small, \$18; large, \$26. 35@35&10%
Ives' No. 4, \$ per doz \$60..... 40%
Swan's..... 40%
Steer's, No. 1, \$26; No. 2, \$18..... 35&10%
Stearns' No. 2, \$48..... 20%

Gimlet Bits—

Common.....	\$ per gross \$2.75@3.25	
Diamond.....	\$ per doz \$1.25..... 40&10% <td></td>	
Bee.....	25@25&5%	
Double Cut, Shepardson's.....	45@45&10% <td></td>	
Double Cut, Ct. Valley Mill Co., 30&10% <td></td>		
Double Cut, Hartwell's, \$ per gro. \$5.00, 25%		
Double Cut, Douglass'.....	40&10% <td></td>	
Double Cut, Ives.....	60@60&10% <td></td>	

Hollow Augers—

Ives'.....	\$ per gross \$2.75@3.25	
French, Swift & Co. (Beecher) {	33@33% <td></td>	
French, Swift & Co. (Beecher) { 10% <td></td>		
Douglass'.....	& 10% <td></td>	
Bonney's Adjustable, \$ per doz \$48.....	50% <td></td>	
Star.....	30@30&10% <td></td>	
Ives' Expansive, each \$4.50, 20% <td></td>		
Universal Expansive, each \$4.50, 20% <td></td>		
Wood's.....	25@25&10% <td></td>	
Choinnati Adjustable.....	25&10% <td></td>	
Cincolnati Standard.....	25&10% <td></td>	

Ship Augers and Bits—

L'Hommiedieu's.....	16&10@16&10&5% <td></td>	
Watrous'.....	25@25&10% <td></td>	
Snell's.....	25@25&10% <td></td>	
Snell's Ship Auger Pattin's Car Bits, 16&10@16&10&5% <td></td>		

Awl Hafts—See Hafts, Awl.**Awls—**

Awls, Sewing, Common.... \$ gr. 85@90¢
Awls, Should. Peg.... \$ gr. \$1.50@\$1.55
Awls, Pat. Peg.... \$ gr. 35@38¢
Awls, Shouldered Brad.... \$ gr. \$1.30@1.40
Awls, Handled Brad.... \$ gr. \$2.60@\$3.00
Awls, Handled Scratch.... \$ gr. \$0.04@\$.20
Awls, Socket Scratch.... \$ per doz \$1.10@\$1.20

Awl and Tool Sets—See Sets, Awl and Tool.**Axes—**

Plain, Beveled.
First quality, best brands \$7.00..... \$7.50
Second quality..... 6.50..... 7.00
First qual., other brands { 0.75
Second quality..... 6.50..... 6.00

Axle Grease—See Grease, Axle.**Axes—**

No. 1, \$14@41¢, No. 2, 5¢@6¢		
Nos. 7 to 14.....	60@60&10% <td></td>	
Nos. 15 to 18.....	47@47% <td></td>	
Nos. 19 to 22.....	70% <td></td>	
Concord Axles, loose collar.....	41@46¢	
Concord Axles, solid collar.....	54@7¢	
National! Tubular Self Oiling.....	88@88%&5%	

Chalk Lines —See <i>Lines</i> .
Checks, Door —.....50%
Unity
Chisels —
Socket Framing and Firmer
P. S. & W.
New Haven, .....75&10@75&10&10%
Witherby, .....75&10@75&10&10%
Mix.
Ohio Tool Co. ....75@75&5%
Douglas, ....50@75&5%
Buck Bros. ....50%
Merrill. ....60&10@60&10&5%
L. & J. White. ....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers. ....50@50&10%
Butchers'. ....\$4.75@55&5%
Spear & Jackson's. ....50@5%
Cold Chisels, # D. ....15@16%
Chucks —
Beach Pat. ....each, \$8.00. ....20%
Morse's Adjustable, each, \$7.00, 20@20&5%
Danbury. ....each, \$6.00, 30@30&5%
Syracuse Balz Pat. ....25%
Graham Patent. ....33@33%
Skinner's Patent Chucks.
Combination Lathe Chucks. ....33@33%
Universal Lathe Chucks. ....40%
Independent Lathe Chucks. ....40%
Drill Chucks. ....15%
Union Mfg. Co.
Victor. ....\$8.50, 25%
Combination. ....40%
Universal. ....40%
Independent. ....40%
Churns —
Tiffin Union, each, 5 gal. \$3.25; 7 gal., \$3.75; 10 gal. \$4.25.
McDermid Star Barrel Churn, each 6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.
Clamps —
R. I. Tool Co. Wrought Iron. ....25%
Adjustable, Hammers. ....15@15&5%
Adjustable, Stearn's. ....30@30&10%
Steam's Adjustable Cabinet and Mirror. ....30@30&10%
Cabinet, Sargent's. ....70@75&5%
Carriage Makers' Sargent's. ....75@75&5%
Carriage Makers', P. S. & W. Co. ....40@40%
Berhard Mfg. Co. ....10@10@10@10&10%
Warner's. ....40@10@40@10&5%
Saw Clamps, see Vises, Saw Fliers.
Carpenter's, Cincinnati. ....25@25%
Sarnes' Machinists' Clamps. ....33@33%
Cleavers, Butchers' —
Bradley s. ....24@30%
L. & L. J. White. ....20@5%
Beatty's. ....40@40@5%
New Haven Edge Tool Co.'s. ....40%
P. S. & W. ....33@33@33@40@10%
Foster Bros. ....30%
Schulte, Lohoff & Co. ....40@40@5%
Clips —
Norway Axle, # 4 & 5-16. ....55@55&5%
2d Grade Norway Axle, # 4 & 5-16. ....45@5%
Superior Axle Clips. ....65@65@70@70%
Norway Spring Bar Clips, 5-16. ....60@55&5%
Wrought Iron Felloe Clips.# D. 5@5%
Steel Felloe Clips.# D. 5@5%
Baker Axle Clips. ....25%
Cloth and Netting, Wire —
—See <i>Wire</i> , &c.
Cockeyes —.....50%
Cocks Brass —
Hardware list. ....60@2%
Coffee Mills —See <i>Mills, Coffee</i> .
Collars, Dog —
Chapman Mfg. Company, new list. ....40%
Medford Fancy Goods Co. ....40@10@60@50%
Embossed, Gilt, Pope & Steven's list. ....30@10%
Leather, Pope & Steven's list. ....40%
Brass, Pope & Steven's list. ....40%
Fitch's. ....50@10@50@10@10%
Rubber, per doz. \$10.00. ....25%
American Curry Comb Co. ....33@40@5%
Kohler's Magic Oscillating.# doz. \$2.00
Kohler's Humane.# doz. \$1.75
Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70@10%
Bemis & Call Co.'s
Dividers. ....65%
Compasses. ....50@55%
Calipers, Inside or Outside. ....65%
Calipers, Wln. ....60%
Calipers, Double. ....65%
Calipers, Call's Patent Inside. ....55%
Excisor. ....50%
J. Stevens & Co.'s. ....25@10%
Starrett's
Spring Calipers and Dividers. ....25@10%
Lock Calipers and Dividers. ....25%
Combination Dividers. ....25%
Coolers, Water —
S. & S. Co.: 2-gal. \$1.30; 3-gal. \$2.00; 4-gal. \$3.00; 6-gal. \$3.75 each. ....33@33%
Coopers' Tools —
See <i>Tools, Coopers'</i> .
Cord —
Sash—
Common.# D. 9@10%
Patent, good quality.# D. 11@12%
White Cotton Braided, fair.# D. 24@25@25%
Common Rustic Sash.# D. 24@25@15%
Patent Rustic Sash.# D. 13@14@15%
Cable Laid Italian Sash.# D. 10@10@10%
India Cable Laid Sash.# D. 11@12@12%
Silver Lake—
A quality, White. 50¢. ....25%
B quality, Drab. 55¢. ....25%
C quality, White 30¢. ....10%
B quality, Drab. 35¢. ....10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab. 39¢
Semper Idem, Braided, White. ....27@28¢
Egyptian, India Hemp, Braided. ....26¢
Massachusetts, White. ....29¢
Samson—
Braided, White Cotton.# D. 37¢
Braided, Drab Cotton.# D. 42¢
Braided, Italian Hemp.# D. 40¢
Braided, Linen.# D. 56¢
Tate's Sold Braided—
Hercules, White.# D. 25¢
Hercules, Drab.# D. 30¢
Economy Drab.# D. 27¢
Economy White.# D. 22¢
Passaw Millis—
Braided, Giant, Whit. # D. 30¢. ....20%
Braided, Giant, Drab and Fancy, # D. 35¢. ....10%
Drilled, Crown White, # D. 50¢...50¢
braided, Crown Drab and Fancy, # D. 55¢...55¢
Wire Picture —
Braided or Twisted. ....80@5@80@15%
Corkscrews —See <i>Screws, Cork</i> .
Corn Knives and Cutters —
—See <i>Knives, Corn</i> .
Crackers, Nut —
Table (H. & B. Mfg. Co.) ....40%
Blake's Pattern, # doz. \$2.00. ....10%
Turner & Seymour Mfg. Co. ....50%
Acme.
Japanned, # gro. \$30. ....50%
Nickel Plated, # gro. \$30. ....10%
Cradles —
Grain. ....50@2@50@5&2%
Crayons —
White Crayons, # gross. ....7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers, # gross, \$1.75. ....25%
Rolling Mill, # gross, 2.50. ....25%
Railroad, # gross, 2.00. ....25%
Soapstone Pencils, # gross, 1.00. ....10%
See also <i>Chalk</i> .
Creamery Pails —See <i>Pails, Creamery</i> .
Crow Bars —See <i>Bars, Crow</i> .
Curry Combs —
See <i>Combs, Curry</i> .
Curtain Pins —
See <i>Pins, Curtain</i> .
Cutters —
Meat —
Dixon's, # doz. ....40@5%
Nos. ....1 2 3 4 5 6
\$14.00 \$17.00 \$19.00 \$30.00
Woodruff's, # doz. ....40@5%
Nos. ....100 150
\$16.00 \$18.00
Hale's Pattern, # doz. ....70%
Nos. ....11 12 13
\$27.00 \$33.00 \$45.00
American. ....30%
Nos. ....1 2 3 4 5 6
\$5 57 \$10 32 \$50 \$60
Enterprise. ....25%
Nos. ....10 12 22 32 42
\$3 \$2.50 \$4 \$6 \$15
Great American Meat Cutter. ....30@30@5%
Nos. ....112 116 118 120 122
Each. \$2.00 \$2.75. \$3.00 \$3.50 \$4.00
Miles' Challenge, # doz. ....45@45@10%
Nos. ....1 2 3
\$22.00 \$30.00 \$40.00
Home No. 1, # doz. \$26.00. ....55@10%
Draw Cut, each: Nos. 5 6 8
\$50 \$75 \$80 \$225. ....20@25%
Beef Shavers (Enterprise). ....20%
Little Giant (P. S. & W. Co.). ....50%
Chadborn's Smoked Beef Cutter, # doz. \$66.00
Tobacco —
Champion. ....20@10@30%
All Iron.# doz. \$4.25
Nashua Lock Co. s. # doz. \$18.00, 50@55%
Wilson's. ....55%
Sargent's.# doz. \$24.00, 55@10%
Acme.# doz. \$20.00, 40%
Washer —
Smith's Pat.# doz. \$12.00, 20@10@10%
Johnson's.# doz. \$11.00, 33@41%
Penny's.# doz. Pol. S. I. Jad. \$16. 55¢
Appleton's.# doz. \$18.00, 60@10%
Bonney's. ....30@10%
Cincinnati. ....25@10%
Dampers, &c. —
Dampers, Buffalo. ....40@10%
Buffalo Damper Clips. ....40@10%
Crown Damper. ....40%
Excisor. ....40@10%
Diggers, Post Hole, &c. —
Samsom, # doz. \$34.00. ....25@25@10%
Fletcher Post Hole Augers, # doz. \$36.00. ....20@20@10%
20@20@10%
Eureka Diggers, # doz. \$12.00 @ \$13.00
Vaughan's Post Hole Auger, # doz. \$18.00
Kohler's Little Giant.# doz. \$18.00
Kohler's Hercules.# doz. \$14.00
Kohler's Invincible.# doz. \$12.00
Kohler's New Champion.# doz. \$8.00
Schedler.# doz. \$18.00
Cronk's Post Bars, # doz. \$24.00. ....50%
50@50@50@10%
Gibb's Post Hole Digger.# doz. \$15.00
Gibb's National.# doz. \$12.00
Gibb's Columbia.# doz. \$13.00
Gibb's Imperial.# doz. \$7.50
Shimer's Hollow Handle.# doz. \$24.00. ....50%
Dividers —See <i>Compasses</i> .
Dog Collars —See <i>Collars, Dog</i> .
Door Checks —
See <i>Checks, Door</i> .
Door Springs —
See <i>Springs, Door</i> .
Drawers —
Money, # doz. ....\$18@20
Drawing Knives —
See <i>Knives, Drawing</i> .
Drills and Drill Stocks —
Blacksmiths' Self-Feeding, each \$1.75
Blacksmiths' Self-Feeding, each \$7.50, 20%
Breast, F. S. & W. ....40@10%
Breast, Johnson's. ....30@5%
Breast, Miller's Falls. ....each \$3.00, 25%
Breast, Bartholomew's. ....each \$2.00. ....25@10@40%
Ratchet, Merrill's. ....20@20@5%
Ratchet, Ingersoll's. ....20@20@5%
Ratchet, Parker's. ....20@20@5%
Ratchet, Whitney's. ....20@20@5%
Ratchet, Weston's. ....20@20@5%
Ratchet, Moore's Triple Action. ....25@30%
Ratchet, Curtis & Curtis. ....30%
Whitney's Hand Drill, Plain. ....\$1.00; Adjustable. \$12.00. ....20@10%
Automatic Boring Tools. ....\$1.75@1.85
Chicocke Automatic Drill. ....20@10%
Goodell Automatic Drills. ....40@5%
Twist Drills —
Cleveland. ....50@10@10%
Diamond, W. & B. ....50@20@10%
Graham's Pat. Groove Shank. ....50@20@10%
Morse. ....50@20@10%
New Process. ....50@20@10%
Standard. ....50@20@10%
Syracuse (Meta list). ....60@10%
Drill Bits or Bit Stock —
Butcher's List. ....Butcher's List, 20%
Stubbs. ....Stubbs list, 25@25@30%
Fixtures, Grindstone —
Sargent's Patent. ....Sargent's Patent
Reading Hardware Co. ....Reading Hardware Co.
P. S. & W. Co. ....P. S. & W. Co.
Fluting Machines —
See <i>Machines, Fluting</i> .
Fluting Scissors —
See <i>Scissors, Fluting</i> .
Fodder Squeezers —
See <i>Squeezers, Fodder</i> .
Forks —
Hay Manure, &c. Asso. List. ....70@70@10@5%
Hay, Manure, &c. Phila. List. ....60@60@10@5%
Plated, see Spoons.
Frames —
Saw —
White Vermont.# gro. \$9.00 @ \$10.00
Red, Polished and Varnished.# doz. \$1.50, 50@5%
Screen, Window and Door —
Porter's Pat. Window and Door Frame. ....30@30@10@5%
Warner's Screen Corner Irons. ....30@30@10@5%
Stearns' Frames and Corners. ....25@25@10@5%
Cortland. ....40@40@5%
Phillips' Window Screen Frames. ....50@50@5%
Bonanza Window Screens. ....50@50@10@5%
Empire Fancy Screen Doors.# doz. \$13
Freezers Ice Cream —
White Mountain. ....60@60@5%
Granite State. ....65@65@5%
Arctic. ....70@70@5%
American. ....60%
Buffalo Champion. ....65@65@5%
Shepard's Lightning. ....65@65@5%
Glory. ....65%
Blizzard. ....70%
Double Action Crown. ....60%
Crown. ....60%
Star. ....60%
Peerless. ....60@10%
Giant. ....60%
Zero. ....60%
Boss and Pet. ....60@10@5@10@5%
Keystone, F. D. & Co. each. ....\$1.50, 10@10@5%
Standard. ....60@60@5%
Standard Double Action. ....60@60@5%
Expert. ....60@60@5%
Model. ....60@60@5%
Confectioners Machine. ....60@60@5%
Fruit and Jelly Presses —
See <i>Preses, Fruit and Jelly</i> .
Fruit Pickers —
See <i>pickers, fruit</i> .
Fry Pans —See <i>Pans, Fry</i> .
Funnels —
Gerson's Perfection, Standard and Globe. ....Tin, 1 gro. 10%; 2 to 5 gro. 20%; 5 to 10 gro. 30%; 10 to 15 gro. 40%; 15 to 20 gro. 50%; over 20 gro. 60%;
Furnaces, Soldering —
Burgess No. 3 Gem tin reservoir. ....\$7.00
Burgess No. 3 Gem, Copper reservoir. ....\$8.50
Clayton & Lambert No. 1 Fire-Pot, complete. ....\$6.00
Fuse —Dis. 12@14@15%.# 1000 ft. Common Hemp Fuse, for dry ground. ....\$2.70
Common Cotton Fuse, for dry ground. ....2.85
Single Taped Fuse, for wet ground. ....3.58
Double Taped Fuse, for very wet ground. ....4.80
Triple Taped Fuse, for very wet ground. ....6.00
Small Gutta Percha Fuse, for water. ....7.50
Large Gutta Percha Fuse, for water. ....12.00
Gates Molasses —
Stebbin's Patent. ....80@80@5%
Stebbin's Genuine. ....80@80@10%
Stebbin's Tinned Ends. ....40@10%
Lincoln's Pattern. ....70@70@10%
Weeds. ....20@10%
Boss.# doz.
No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4, \$10. ....80@10@10%
Gauges —
Marking Mortise, &c. ....60@10%
Starrett's Surface, Center and Scratch. ....25@10%
Stanley R. & L. Co.'s Butt and Rabbit Gauge. ....20@10%
Barrett's Comb. Roller Gauge.\$ doz. \$8.00 @ \$8.50
John Sommers' Peacock Best Block Tin Key. ....40%
IXL, 1st quality, Cork Lined. ....50%
Diamond Lock. ....40%
Perfection Fla. Red Cedar (in boxes). ....40%
Boss Metallic Key. ....50%
Reliable Cork Lined. ....60%
O. K. Western Pattern Cork Lined. ....50%
No Brand, Red Cedar (in bbls.). ....50@10%
Western Pattern Metal Key. ....40%
No Brand Metal Key. ....60%
Self Measuring Enterprise.# doz. \$36.00. ....20%
Lane's # doz. \$36.00. ....25@10%
Feloe Plates —
See <i>Plates, Feloe</i> .
Fibre Ware —See <i>Ware, Fibre</i> .
Fifth Wheels —
Derby and Cincinnati. ....45@5%
Brewster. ....50@5%
Files —
Domestic—
Nicholson Files, Rasps, &c. 60@10@5@
60@10@10%
Nicholson (X.F.) Files. ....25%
Nicholson's Royal Files (Seconds). ....75% (extra prices on certain sizes)
American. ....60% & 10@60% & 10@5%
G. H. & Barnett (Black Diamond) 60@10@60@10@5%
Arcade. ....60@10@10@5@
Eagle. ....60@10@10@5@
Other makers, best brand. ....80@10@5@
Fair brands. ....70@70@10@5%
Second quality. ....75@70@10@5%
Heller's Horse Rasp. ....60@7@5@
McCaffrey's Horse Rasp. ....50@10@5@
Chester Horse Rasp, Hand Cut. ....50@10@5@
Arcade Horse Rasp. ....60@10@60@10@5@
Trojan Horse Rasp. ....60@10@5@
Imported —
Butcher's List. ....Butcher's List, 20%
Stubbs. ....Stubbs list, 25@25@30%
Crindstones —
Family, regular list. ....60%
Family, Cleveland Stone Co. ....90%
Crindstone Fixtures —
See <i>Fixtures, Crindstone</i> .
Gun Powder —See <i>Powder</i> .
Hack Saws —See <i>Saws</i> .
Hawks, Awl —
Sewing, Brass, Fer. gr. ....\$1.75
Pat. Sewing, Short. # doz. ....45@50%
Pat. Sewing, Long. # doz. ....\$1.50 @ \$1.50
Pat. Peg. Top. # doz. ....40@45@5%
Pat. Peg. Leather Top.# doz. ....\$1.50
Glue Pots —See <i>Pots, Glue</i> .
Crease, Axle —
Fraser's. ....Keg # D 4, Pail # D 5@5
Fraser's, in boxes.# gr. ....\$1.50 @ \$1.50
Dixon's Everlasting, in bxs.# doz 1 D 20@20@20@5@
Lower grades, special brands.# gr. \$5.50 @ \$7.00
Axleline, tin boxes.# gross \$12.00
English Coach, wooden boxes.# gross \$5.50
English Coach, 5-lb. tin pails.# doz. \$5.50
Tiger, wooden boxes.# gross \$7.00
Tiger, 5-lb. tin pails.# doz. \$5.50
Crindstones —
Family, regular list. ....60%
Family, Cleveland Stone Co. ....90%
Crindstone Fixtures —
See <i>Fixtures, Crindstone</i> .
Gun Powder —See <i>Powder</i> .
Hawks, Awl —
Sewing, Brass, Fer. gr. ....\$1.75
Pat. Sewing, Short. # doz. ....45@50%
Pat. Sewing, Long. # doz. ....\$1.50 @ \$1.50
Pat. Peg. Top. # doz. ....40@45@5%
Pat. Peg. Leather Top.# doz. ....\$1.50

Halters—

Covert's, Rope, Jute.....	60&10@10&10%
Covert's, Rope, 7-16-in., Jute.....	70&2%
Covert's, Rope, 14-in., Hemp.....	60&2%
Covert's Adj. Rope Halters.....	40&2%
Covert's Heavy Horse and Cattle Tie, 50&10@10&2%	
Covert's Jute Horse Ties.....	70&2%
Covert's Jute Cattle Ties.....	70&10&2%
Covert's Adj. Web Halters.....	35&8&2%
Covert's Saddlery Works Halters.....	33&1%
Covert's Saddlery Works Horse and Cattle Ties... ..	33&1%

Hammers—

Handled Hammers—	
Maydole's, list Dec. 1, '85.....	25&10@35%
Buffalo Hammer Co.	
Humason & Beckley.....	50&10@
Atha Tool Co.	
Verree.....	
C. Hammond & Son.....	40&10@-x
Fayette R. Plumb.	
Artisan's Choice, A. E. Nail.....	40&10%
Regular Y. & P. A. E. Nail.....	50%
Horseshoe Turning Hammers.....	50%
Other Hammers.....	50&10%
Cheney's Claw.....	40&10%
Cheney's Machinist's & Riveting.....	50&5%
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 10&10% 1.75.....	30&8&10%
Nelson Tool Works.....	40&8&10%
Warner & Nobles, new list.....	25&10
Peck, Stow & Wilcox.....	30&40%
Sargent's.....	40&40@10%

Heavy Hammers and Sledges—

8 lb and under.....	30&40%
8 to 5 lb.....	30&84%
Over 5 lb.....	30&80%

Wilkinson's Smiths..... 10&4@11&7@n

Handcuffs and Leg Irons

See Police Goods.

Handles—

Cross-Cut Saw Handles—	
Atkins', new list.....	40%
Champion.....	15%
Ely's Perfection.....	30, \$5.00

Iron, Wrought or Cast—

Door or Thumb.	0 1 2 3 4
Nos.	Per doz. \$0.90 1.00 1.08 1.35 1.50
80&10@10&10%	
Roggins' Latches.....	* doz \$0.30@35%
Brosse Iron Drop Latches.....	* doz 70&2% net
Jay's Store Door Handles—Nuts, \$1.62; Plate, \$1.10; no plate, \$0.88.....	net
Barn Door, * doz \$1.40.....	10&10%
Chest and Lifting.....	70@70&10%

Wood—

Saw and Plane.....	40&10@50%
Hammer, Hatchet, Axe, &c.	40@40&5%
Brad Awl.	* gr \$2.00
Hickory Firmer Chisel, ass'd.	* gr 1.50
Apple Firmer Chisel, ass'd.	* gr 5.00
Socket Firmer Chisel, ass'd.	* gr 3.00
Socket Framing Chisel, ass'd.	* gr 5.00
J. B. Smith & Co.'s Pat File.....	50%
File, assorted.....	* gr 2.75
Auger, assorted.....	* gr 5.00
Auger, large.....	* gr 7.00
Pat. Auger, Ives.....	30&10%
Pat. Auger, Douglass.....	* set \$1.25
Pat. Auger, Swan's.	* set \$1.00
Hoe, Rake, Shovel, &c.	60@30&5%

Hangers—

Barn Door, old patterns.....	70@70&5%
Barn Door, New England.....	70@70&5%
Samson Steel Anti-Friction.....	55%
Orleans Steel.....	55%
Hamilton Wrought Steel Track.....	55%
Champion.....	60&10%
Climax Anti-Friction.....	55%
Zenith for Wood Track.....	55%
Sterling.....	50&10@60%
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	50&2%
Kidder's.....	50@50@10%
Boss.....	60@10@60&10@5%
Best Anti-Friction.....	60@10@60&10@5%
Duplex (Wood Track).....	60@10@5%
Terry's Modern.....	50&10@50&10@5%
Terry's Ideal.....	50@10@50@10@5%
Terry's Solid.....	50&10@60%
Terry's Shield.....	50@10@60%
Terry's Wrought Single Strap.....	50&10%
Cronk's Patent, Steel Covered.....	50@10%
Carrier Steel Anti-Friction.....	50&10%
Richards'.....	30@30@10%
Lane's New Standard.....	60@50@5%
Lane's Standard.....	50@50@50@10%
Lane's Parlor.....	40%
Warner's Pat.....	20@10@10%
Stearns' Anti-Friction.....	20@10@10%
Stearns' Challenge.....	25@10@10%
Cincinnati Nos. 1, \$2.25; 3, \$3.60; 4, \$3.50.....	
Paragon, Nos. 5, 5½, 7 and 8.....	20&10%
Crescent.....	60@60@10%
Nickel Steel, Nos. 0, \$35; 1, \$30; 2, \$16.....	40@40@10%
Chicago Anti-Friction.....	30@10%
Star.....	40@10@40@10@5%
Barry.....	40%
Interstate.....	50@10@50%
Pendulum, Payson's.....	40@40@10%
Wood.....	45%
Economy, \$6.00.....	50@10@10%
Perfection.....	50@10@50@10@5%
Lundy, Steel Parlor.....	40%
Matchless.....	50@10%
Magic.....	45@10%
Moore's Elevator.....	33&1%
Moore's Baggage Car Door.....	33&1%
Moore's Railroad.....	55%

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co. Blood's....	
Hunt's....	
Hurd's....	
Mann's....	
Peck's....	
Underhill's....	40 & 10 @ 50&5%
Buffalo Hammer Co.	
Fayette R. Plumb.	
C. Hammond & Son.	
Kelly's....	
Sargent's & Co.	
P. S. & W. Co.	
Ten Eyck Edge Tool Co.	10%
Collins, Lohoff & Co.	54@50@5%

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Parker.....	75&2%
Huffer.....	50%
Clark's, Nos. 1, 2, 3, 4, 40 and 50.....	80@80&5%
Clark's Mortise Gravity.....	50%
Sargent's, Nos. 1, 2, 3, 4, 11, 12, 13, 75@75@10%	
Reading's Gravity.....	75@10@75@10@5%

Shepard's, Noiseless.....

Buffalo.....

Clark's Genuine Pattern.....

O. S. Lull & Porter.....

Acme, Lull & Porter.....

Queen City Reversible.....

Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....

North's Automatic Blind Fixtures, No. 2, for Wood, \$3.00; No. 3, for Brick, \$1.50.....

Buckman's.....

Union Mfg. Co.

Bommer's.....

Buckman's.....

Chicago.....

Bardsley's Patent Checking.....

Acme.....

U. S.

Empire and Crown.....

Hero and Monarch.....

American, Gem and Star.....

Oxford.....

Royal.....

Reliable.....

Champion.....

No. 10 Matchless.....

No. 25 Unbreakable.....

J. G. C. Covered, * gro, \$30.....

Sanson's.....

Willes' No. 1, * gro, \$16; No. 2, * gro, \$12.....

Devere, No. 1, * gro, \$12; No. 2, * gro, \$10.....

Rex.....

Peerless.....

New Idea Nos. 1 and 10, * gross \$13.00.....

New Idea Dbl. Acting.....

Ideal No. 3, * gross \$10.00.....

Stearns' Noiseless Floor Hinge, * set, \$5.00.....

Rear.....

List February 14, 1891.

Strap and T.

Corrugated Strap and T.

Screw Hook and Eye, 6 to 12 in., * doz 14¢.....

Screw Hook and Eye, 14 to 20 in., * doz 34¢.....

Strap, * 22 to 36 in., * doz 3¢.....

(1/4 in., * doz 73¢)

(1/2 in., * doz 54¢)

(3/4 in., * doz 43¢)

(1 in., * doz 34¢)

Roled Raised.....

Plate Hinges, 8, 10 & 12 in., * doz 14¢.....

" Providence" over 12 in., * doz 14¢.....

Hinged.....

Roled Plate.....

70@10%

Plated Brass Kettles.....

Stamped Brass Kettles.....

Enamelled and Tea—See Ware, Hollow.

Kettles—

Brass, Spun, Plain, list Jan. 1, '91, 25&5%

Brass, Plated, W.M. list Jan. 1, '91, 20%

Cotton Chalk.....

Samson Cotton, No. 4, \$2; No. 4½, \$2.50;

Silver Lake, Braided No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 4½, \$8.50

Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25

Cotton Chalk.....

Samson Cotton, No. 4, \$2; No. 4½, \$2.50;

Silver Lake, Braided No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 4½, \$8.50

Mason's Colored Cotton.....

Wire Clothes, Nos. 18, 19, 20

100 ft.

Hotchkiss' Brass Blanks.....

Hotchkiss' Copper and Tinned.....

Nichols' Copper Kettles.....

W. W. Wilson's Butter, 3 lb., \$2.00; 7

in 27.70; 8 in. \$3.80, &c.

Ames' Bread Knives, * doz \$1.50, 15@20@25%

Ames' Shoe and Bread, * doz \$1.50, 15@20@25%

Moran's Shoe and Bread, * doz \$1.50, 15@20@25%

Hay and Straw—See Hay Knives.

Table and Pocket—See Cutlery.

Sash—

Motley's Adj. Sash, Medium Size.....

* doz \$1.20, 10¢

Balz Pat.

Nicholson File Holders.....

20%

File and Tool—

Balz Pat.

* doz \$4.00, 25¢

Nicholson File Holders.....

20%

Sash—

Motley's Adj. Sash, Medium Size.....

* doz \$1.20, 10¢

Holes—

Cast Iron—

Bird Cage, Sargent's List.....

Bird Cage, Reading.....

Clothes Line, Sargent's List.....

50@10@10@10%

Schulte, Lohoff & Co.

54@50@5%

Clothes Line, Reading List.....

50@10@10@10%

Sargent's List.....

50@10@10@10%

Brittan, Graham & Mathes, list Jan. 1890.	60&10/10&10%
Plate.	50&10/10%
Barney Mfg. Co.	40&10/10%
Yale.	net prices
Deitz Flat Key.	30%
Bomer's Night Latches.	15%
Brooklyn Latches.	50&10%
Warner's Burglar Proof. # doz. \$8.00, 50%	
Padlocks—	
List June 10, 1891.	50&2%
Norwich Lock Mfg. Co., old list.	50&2%
Lyle Lock Mfg. Co.'s.	net prices
Eagle.	40%
Eureka, Eagle Lock Co.	40&2%
Bomer's Nos. 0 to 91.	30%
Bomer's Scandinavian, &c., Nos. 100 to 508.	15%
A. E. Deitz.	40%
Champion Padlocks.	40%
Hotchkiss.	30%
Sher.	20%
Horseshoe.	# doz \$9.50&10/10%
Barnes Mfg. Co.	40&10/10%
No. 4 line.	30%
No. 61 line.	60&5%
No. 21 line.	75&10%
Sash, &c.—	
Clark's No. 1, \$10; No. 2, \$8 # gr.	33&4%
Ferguson's.	33&4%
Victor.	60&10/8&2%
Walker's.	10%
Attwell Mfg. Co.	50&10/8&2%
Reading.	60&10/10@60/10/10&10%
Hammond's Window Springs.	40%
Common Sense, Jap'd, Cop'd and Brzd.	40%
Common'Sense, Nickel Plated.	# gr \$4.00
Universal.	\$10%
Kempshall's Gravity.	60%
Kempshall's Model.	60&@60&10%
Cordis' Dols. list Feb. 10, 1888.	70%
Payson's Perfect.	60/10/10%
Hughin's New Sash Balances.	25&5&2%
Ives' Patent.	60&10/6@60/10/10%
Fish (Liesche's pat.), No. 100, # gr. \$8; No. 105, # gr. \$10.	50%
Davis, Bronze, Barnes Mfg. Co.	60%
Champion Safety, list January 1893. 70&5%	
Security.	70%
Giant, list Jan. 1892.	70&5%
Wolcott's.	60&10/5%
Monarch.	50%
Lumber Tools—	
See Tools, Lumber.	
Lustro—	
Four-ounce bottles.	# doz, \$1.75; # gross.
	\$17.00
Machines.	
Boring—	
Without Augers.	Upright, Angular.
Douglas.	\$5.50 \$6.75....50%
Snell's, Rice's Pat.	5.50 6.75.40&10&10%
Jennings'.	5.50 7.65.45&15&10%
Other Machines.	2.35 2.75
Phillips' Patent with Augur.	7.00 7.50....25%
Miller's Falls.	7.50
Fluting—	
Knox, 4½-inch Rolls.	\$.33.25 each} 85%
Knox, 6-inch Rolls.	\$.33.60 each}
Eagle, 3½-inch Rolls.	\$.21.50
Eagle, 5½-inch Rolls.	\$.28.50
Crown, 4½ in.	\$.35.00
6 in.	\$.40.00
8 in.	\$.55.00
Crown Jewel, 6 in.	\$.35.50 each, 35%
American, 5 in.	\$.30.00
6 in.	\$.34.00
7 in.	\$.45.00 each.
Domestic Fluter.	each, \$1.50
Geneva Hand Fluter, White Metal.	
Crown Hand Fluter, Nos. 1, \$16.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.	30%
Shepard Hand Fluter.	No. 85, per doz \$15.50.
Shepard Hand Fluter, No. 110, # doz \$11.00.	40%
Shepard Hand Fluter No. 65, # doz \$8.00.	40%
Combined Fluter and Sad Iron.	40%
	# doz \$15.00....80%
Hoisting—	
Moore's Hand Hoist, with Lock Brake.	20%
Moore's Anti-Friction Differential Pulley Block.	20%
Energy's Mfg. Co.'s.	25%
Sure Grip Steel Tackle Blocks.	25%
Washing—	
Anthony Wayne, # doz, No. 1, \$42; No. 2, \$36; No. 3, \$24.	
Wayne American.	# doz \$36.00
Western Star # doz, No. 2, \$36; No. 3, \$39.	
Welsell.	# doz \$54.00
Fair, and Square.	# doz \$42.00
Mallets—	
Hickory.	20&10/20&10/10&10%
Lignumvitae.	20&10/20&10/10&10%
B. & L. Block Co., Hickory & L. V.	80&30/10
Mattocks—Regular list.	
60&10/60&10&5%	
Measures—	
Standard Fiberware, No. 1, peck # dozen.	\$8.50; ½-peck, \$8.00.
Meat Cutters—	
See Cutters, Meat.	
Pails—	
Menders, Harness.	# doz \$2.00
Milk Cans—See Cans, Milk.	
Mills—	
Coffee—	
Box and Side, List Jan. 1, 1888. 60&10/60&10%	
Net prices are often made which are lower than above discount.	
American, Enterprise Mfg. Co., list Jan. 17, 1893.	20%
The Swift, Lane Bros.	30%
Packing, Steam—	
Rubber—	
Standard.	.70&70&10%
Extra.	.60&60/5%
N. Y. B. & P. Co., Standard.	.60%
N. Y. B. & P. Co., Empire.	.60%
N. Y. B. & P. Co., Salamander.	.25%
Jenkins' Standard, # doz 80¢.	23@25&5%
Miscellaneous—	
American Packing.	10&11 # doz
Austria Packing.	14 # doz
America Packing.	13@14 # doz
Cotton Packing.	15@17 # doz
Int.	17@19 # doz
Pliers and Nippers—	
Button's Patent.	
Hall's, 18-qt.	\$5.00 \$5.25 to \$8
Auburn Thistle.	
Ohio.	
Sandusky.	
L. & J. I. White.	
Stanley R. & L. Co.	50&10%
Plates—	
Felice.	# doz \$46&6%
Pliers and Nippers—	
Button's Patent.	
Hall's, No. 2, 5 in.	\$13.50; No. 4, 7 in.
Stable, 12 qt.	\$21.00 # doz
Hunason & Beckley Mfg. Co.	50&10/10%
Lindsay's Giant.	88&12
Gas Pliers.	
Gas Pliers, Custar's Nickel Plated.	60&25%
Eureka Pliers and Nippers.	40%
Russell's Parallel.	35%
P. S. & W. Cast Steel.	50%
P. S. & W. Tinner's Cutting Nippers, add 6%.	10%
Carew's Pat. Wire Cutters.	20%
Morrill's Parallel, # doz \$12.00....30&25	
Cronk's 5 in.	\$15.00; 10 in.
Cronk's Button Pattern.	50&10/60&6%
Cronk's Carrier Pliers.	60&60/60&6%
Plumbs and Levels—	
Regular List.	75&10/75&10/5%
Stanley's Duplex.	20&10%
Stanley's Handy.	20&10%
Diston's.	50%
Cook's.	40&10%
Pocket Levels.	70&10/70&10/5%
Davis Iron Levels.	40&10%
Poachers, Egg—	
Buffalo Steam Egg Poachers, # doz, No. 1, \$6.00; No. 2, \$9.00.	38&12
Silver & Co., 6-Ring, # doz, \$4.00; 3-Ring.	30%
Pokes, Animal—	
Bishop's I. X. L.	# doz \$6.00
Bishop's Monarch.	3 doz \$4.50
Bishop's Pioneer.	3 doz \$4.00
Bishop's American.	3 doz \$3.50
Eagle, Double Stake.	3 doz \$5.75
Eagle, Single Stake.	3 doz \$2.75
Buckeye, Single Stake.	3 doz \$2.75
Bolding.	3 doz \$6.00
Metallic Horse Poke.	# doz, \$6.00
Police Goods—	
R. I. Tool Co., Handcuffs, \$15.00 # doz 10%	
R. I. Tool Co., Leg Irons, \$25.00 # doz 10%	
Tower's.	
Daley's Improved Handcuffs, 2 Hands, Polished, # doz \$8.00; Nickled, \$7.00; 3 hands, Polished, # doz \$7.00; Nickled, \$6.00.	25%
J. F. Lovell's Police Goods.	25%
Polish—Metal—	
Prestoline.	30%
Prestoline Paste.	38&12
Gaston's Silver Compound.	38&12
Stove—	
Joseph Dixon's.	# gro \$6.00, 110%
Gem.	# gro \$4.50, 102%
Gold Medal.	# gro \$3.00, 28%
Lustro.	# gro, 42&75
Ruby.	# gro, 42&75
Rising Sun, 6 gro lots.	# gro \$5.50
Dixon's Plumagoo.	# doz \$6
Boynton's Noon Day.	# gro \$13.00
Parlor Pride Stove Enamel.	# gro
Yates' Liquid.	2 3 5 10 gal
# gal. \$0.80 .70 .80 .50	
Yates Standard Paste Polish, 10 in cans.	# doz 12
Jet Black.	# gro \$3.50
Japanese.	# gro \$3.50
Fireside.	# gro \$2.50
Diamond O. K. Enamel.	# gro \$19.00
Bonnell's Liquid Stove Polish.	# gro \$9.00
Bonnell's Paste Stove Polish.	# gro \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.	
Black Jack Water Paste, 5 and 10 lb cans.	
Nickel Plate Paste.	# gro \$7.50
Crown Paste in 5 and 10 lb pails.	# doz 12
Black Flag, 5 and 10 lb pails.	# doz 12
Black Flag, Liquid, in bottles.	# gro \$7.50
Diamond Rock Nickel Cleaner.	# gro \$10.00
Raven Paste.	
5-lb. pails, (per case of 6 or 12).	# doz 12
Less than case.	# doz 12
Liquid, 6 oz. bottles.	# gross, \$4.00
Liquid, 8 oz. bottles.	# gross, \$4.00
Water Polish.	# gross, \$4.00
Poppers, Corn—	
Round or Square, 1 qt.	# gr \$10.00@10.50
Round or Square, 12 qt.	# gr \$15.00@15.50
Round or Square, 2 qt.	# gr \$18.50@19.00
Post Hole and Tree Augers and Diggers—	
See Diggers, Post Hole, &c.	
Potato Parers—	
See Parers, Potato.	
Pots—	
Glue—	
Tinned.	40&10/40&10/5%
Enamelled.	40&10/40&10/5%
Family Howes' "Eureka."	40%
Family, L. F. C.'s "Handy."	50%
Powder—	
In Canisters—	
Fine Sporting, 1 lb each.	\$0.00
Duck, 1 lb each.	.50
Rifle, 1 lb each.	.50
Rifle, ½ lb each.	.50
Rifle, ¼ lb each.	.50
In Kegs—	
Rifle, 25-lb kegs.	\$4.00
Rifle, 12½-lb kegs.	2.50
Rifle, 6½-lb kegs.	1.50
Duck, 25-lb kegs.	\$5.00
Duck, 12½-lb kegs.	2.75
Duck, 6½-lb kegs.	1.75
Steers' Iron Planes.	\$0.50@5&5%
Meriden Mfg. Iron Co.'s.	\$0.50@5&5%
Davis' Iron Planes.	\$0.50@5&5%
Birmingham Plane Co.	\$0.50@5&5%
Gage Tool Co.'s Self-Setting.	20&10/10%
Chaplin's Iron Planes.	\$0.50@5&5%
Sargent's.	60&60/60&6%
Standard Tool Co.	\$0.50@5&5%
Plane Irons—	
Butcher's.	\$5.00 \$5.25 to \$8
Buck Bros.	
Auburn Thistle.	
Ohio.	
Sandusky.	
L. & J. I. White.	
Stanley R. & L. Co.	50&10%
Plates—	
Felice.	# doz \$46&6%
Pliers and Nippers—	
Button's Patent.	
Hall's, No. 2, 5 in.	\$13.50; No. 4, 7 in.
Auburn Thistle.	
Ohio.	
Sandusky.	
L. & J. I. White.	
Stanley R. & L. Co.	50&10%
Plates—	
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Plates—	
Felice.	# doz \$46&6%
Pliers and Nippers—	
Button's Patent.	
Hall's, No. 2, 5 in.	\$13.50; No. 4, 7 in.
Auburn Thistle.	
Ohio.	
Sandusky.	
L. & J. I. White.	
Stanley R. & L. Co.	50&10%
Plates—	
Felice.	# doz \$46&6%
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L. & J. I. White.	
Stanley R. & L. Co.	50&1

Snaps, Harness, &c.

Anchor T. & S. Mfg. Co. 65¢
Fitch's (Bristol) 50¢ & 10¢
Hotchkiss 10¢
Andrews 50¢
Sargent's Patent Guarded 70¢ & 10¢
German, new list 50¢ & 10¢ & 25¢
Cover'd New Patent 50¢ & 10¢ & 25¢
Cover'd, New R. E. 60¢ & 10¢ & 25¢
Cover'd Spring 60¢ & 10¢ & 25¢
Cover'd's Saddlery Works' Triumph 33¢ & 5¢
John Frotz Snaps 75¢ & 75¢ & 5¢

Snaths—

Scythe 50¢ & 50¢ & 25¢ & 25¢

Soldering Irons—

See Irons, Soldering.

Spittoons, Cupidors, &c.**Standard Fiberware—**

Cupidors, 8½-inch, ¾ doz., No. 5, \$8; No. 5½, \$9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, \$6.

Spoke Shaves—

See Shaves, Spoke.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—**Tinned Iron—**

Basting, Cen. Stamp. Co.'s list 70¢ & 10¢
Solid Table and Tea, Cen. Stamp. Co.'s list 70¢ & 10¢
Buffalo, S. S. & Co. 33¢ & 25¢

Silver Plated—

months or 5¢ cash 30 days:
Meriden Brit. Co., Rogers 40¢ & 15¢
C. Rogers & Bros. 40¢ & 15¢
Rogers & Bros. 40¢ & 15¢
Reed & Barton 40¢ & 15¢ & 5¢
Wm. Rogers Mfg. Co. 40¢ & 15¢ & 5¢
Simpson, Hall, Miller & Co. 40¢ & 15¢ & 5¢
Holmes & Edwards Silver Co. 40¢ & 15¢ & 5¢
L. Boardman & Son. 50¢ & 12¢ & 5¢

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 97 Mexican Silver 50¢ & 10¢ & 5¢
No. 30 Silver Metal 50¢ & 10¢ & 5¢
No. 24 German Silver 50¢ & 10¢ & 5¢
No. 50 Nickel Silver 50¢ & 5¢
No. 49 Nickel Silver 50¢ & 10¢ & 5¢
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal 50¢ & 10¢ & 5¢
1891 Rogers' German Silver 60¢ & 6¢
22¢ Rogers' Nickel Silver 50¢ & 5¢
German Silver 50¢ & 10¢ & 5¢
German Silver, Hall & Elton, 50¢ & 5¢ cash
Nickel Silver 50¢ & 10¢ & 5¢
Britannia, ... 50¢ & 6¢ & 5¢
Boardman's Nickel Silver, list July 1, 1891, 50¢ & 6¢ & 5¢
Boardman's Britannia Spoons, case lots 60¢ & 5¢ cash

Springs—**Door—**

Torrey's Rod, 39 in. ¾ doz. \$1.20 & 12¢
Warner's No. 1, ¾ doz. \$1.50; No. 2, \$3.40. 50¢ & 65¢ & 10¢
Gem (Coll.), 1st April 19, 1886 20¢
Star (Coll.), 1st April 19, 1886 20¢ & 10¢
Victor (Coll.) 60¢ & 10¢ & 60¢ & 10¢ & 5¢
Champion (Coll.) 60¢ & 10¢ & 60¢ & 10¢ & 5¢
Cowell's, No. 1, ¾ doz. \$1.00; No. 2, \$1.50. 50¢ & 65¢ & 10¢
Rubber, complete, ¾ doz. \$4.50 55¢ & 10¢
Hercules. 50¢ & 65¢ & 10¢
Phoenix. 50¢ & 65¢

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll, 60¢ & 10¢ & 60¢ & 10¢ & 10¢ or net prices
Cliff's Bolster Springs. 25¢

Squares—

Steel and Iron. 30¢ & 10¢ & 10¢ & 80¢ & 25¢
Nickel-Plated. 60¢ & 10¢ & 10¢
Try Square and T Bevels. 50¢ & 10¢ & 10¢
Dulston's Try Square and T Bevels. 50¢
Winterbottom's Try and Mitre. 30¢ & 10¢
Starrett's Micrometer Calliper Squares. 25¢
Avery's Flush Bevel Squares. 40¢
Avery's Bevel Protractor. 50¢

Squeezers—**Fodder—**

Blair's. ¾ doz. \$2.00
Blair's "Climax". ¾ doz. \$1.25
Lemon—
Porcelain Lined, No. 1. ¾ doz. \$6.00
25¢ & 30¢
Wood, No. 2. ¾ doz. \$3.00 35¢
Wood, Common. ¾ doz. \$1.70 & 1.75
Dunlap's Improved. ¾ doz. \$3.75 20¢
Bannmis. No. 1, \$5.00; No. 2, \$9.12
\$18 ¼ doz. 50¢ & 25¢
Jennings' Star. ¾ doz. \$2.50
The Boss. \$1.90; Queen, \$2.50
Dean's. Nos. 1, ¾ doz. \$6.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50
Little Giant. 50¢ & 10¢ & 5¢
King. 40¢ & 5¢
Hotchkiss Straight Flash. ¾ doz. \$12.00
Silver & Co., Glass. ¾ gro. \$9.00

Standard Fiber Ware—

See Ware, Standard Fiber.

Staples—

Barbed Blind, ¼ in. and larger. 3¢ & 7¢ & 14¢
Barbed Blind, ½ in. ¾ doz. \$8 & 12¢
Fence Staples, Galvanized. as Br'B Wire
Fence Staples Plain. See Td.R Rep
Grand Crossing Tack Co.'s list. 75¢ & 10¢
Steelyards. 40¢ & 10¢ & 50¢

Stocks and Dles—

Blacksmith's:
Waterford Goods. 85¢
Butterfield's Goods. 85¢
Lightning Screw Plate. 25¢ & 30¢
Beece's New Screw Plates. 25¢ & 30¢
Reversible Ratchet. 50¢
Gardner. 25¢
Green River. 25¢ & 30¢

Stops, Bench—

Morrill's, ¾ doz., Nos. 1, \$9.50; 2, \$12.00
40¢ & 20¢
Hotchkiss's. ¾ doz. \$5.10 @ 10¢ & 10¢
Weston's, No. 1, \$10 No. 2, \$9, 25¢ & 10¢ & 5¢

McGill's, ¾ doz. \$3. 10¢

Cincinnati. 25¢ & 10¢

Terrell's Nos. 1 and 2, ¾ doz. \$3; No. 3, \$3.60. 30¢

Stone—**Stones, Grind—See Grindstones.****Scythe Stones—**

Pike Mfg. Co., 1st April, 1892. 33¢ & 14¢

Cleveland Stone Co., 1st Nov. 1892. 33¢ & 14¢

Oil Stones, &c.—

Pike Mfg. Co.

Hindostan No. 1, ¾ doz. 8¢

Sand Stone. 5¢

Turkey Oil Stone, 4 to 8 in. 10¢ @ 40¢ & 10¢

Turkey Slips. \$2.00

Lily White Washita. 60¢

Rosy Red Washita. 60¢

Washita Stone, Extra. 60¢

Washita Stone, No. 1. 60¢

Washita Stone, No. 2. 60¢

Lily White Slips. 90¢

Rosy Red Slips. 90¢

Washita Slips, Extra. 80¢

Washita Slips, No. 1. 70¢

Arkansas Stone, No. 1, 3 to 5 in. 33¢ & 14¢

Arkansas Stone, No. 1 ½ to 8 in. 35¢

Lake Superior. 35¢

Lake Superior Slips. 35¢

Stove Polish—

See Polish, Stove.

Stretcher Carpet—

Cast Steel, Polished. ¾ doz. \$2.2

Cast Iron, Steel Points. ¾ doz. 75¢ & 80¢

Socket. ¾ doz. \$1.75

Bullard's. 25¢ & 25¢ & 10¢

Straps, Razor—

Genuine Emerson. 60¢ & 60¢ & 5¢

Imitation. ¾ doz. \$2.00, 20¢ & 10¢ & 5¢

Torrey's. 20¢

Badger's Belt and Com. ¾ doz. \$2.00

Lamont Combination. ¾ doz. \$2.00

Jordan's Pat. Padded, 1st Nov. 1, '89. 50¢

Electric Cutlery Co. Net

Campbell Cutlery Co. Net

Stuffer, Sausage—

Miles' Challenge. ¾ doz. \$2.00, 50¢ & 5¢

Perry. ¾ doz. No. 1, \$1.00; No. 0, \$2.00

L. & J. White. 50¢ & 50¢ & 10¢

Draw Cut No. 4, each \$3.00. 20¢

Enterprise Mfg. Co., 1st Jan. 17, '93. 25¢

Silver's. 40¢ & 10¢

Sweepers, Carpet and Lawn—

See Carpet, Sweeper.

Carpet—

Bissell No. 5. ¾ doz. 17.00

Bissell No. 8. ¾ doz. 20.00

Bissell, Grand. ¾ doz. 25.00

Standard. ¾ doz. 24.00

Domestic. ¾ doz. 21.00

Domestic, No. 2. ¾ doz. 22.00

Grand Rapids. ¾ doz. 24.00

Crown Jewel, No. 1. \$18.00. No. 2. \$19.00; No. 3, \$20.00

Magic. ¾ doz. \$15.00

Improved Parlor Queen, Nicklede. ¾ doz. \$27.00

Japanned. ¾ doz. \$24.00

Excelsior. ¾ doz. \$22.00

Garland. ¾ doz. \$18.00

Parlor Queen. ¾ doz. \$24.00

Housewife's Delight. ¾ doz. \$15.00

Lady's Friend. ¾ doz. \$16.00

Advance. ¾ doz. \$18.00

Our Leader. ¾ doz. \$19.00

Triumph. ¾ doz. \$20.00

Goshen. ¾ doz. \$21.00

Supreme. ¾ doz. \$22.00

Easy. ¾ doz. \$22.00

Gilt Edge. ¾ doz. \$24.00

Acme. ¾ doz. \$26.00

Imperial. ¾ doz. \$26.00

Grand Republic. ¾ doz. \$30.00

Banner. ¾ doz. \$22.00

The Star. ¾ doz. \$21.00

Reliable. ¾ doz. \$22.00

The Rapid. ¾ doz. \$22.00

Our Own. ¾ doz. \$27.00

Model. ¾ doz. \$27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following re-bates:

5 dozen in 6 months. ¾ doz. \$1.00

10 dozen in 6 months. ¾ doz. \$2.00

25 dozen in 6 months. ¾ doz. \$3.00

Except on L.F., when 10 dozen price is \$13.50, and 25 dozen \$13.00.

Lawn—

Thompson Mfg. Co. 30¢

Swings—

Davies' Lawn. 25¢

Tacks, Brads, &c.—

List October 19, 1892. Old established

straight Weights. Short Weight goods

are sold at lower prices.

Carpet Tacks—

American, Blued. 60¢ & 5¢

American, Tin'd and Cop'd. 70¢

Steel, Bright and Blued. 60¢ & 5¢

Steel, Thinned and Coppered. 70¢

Swedes Iron, Blued. 72¢ & 5¢

Swedes Iron, Tinned. 75¢

American Iron Tacks, Domestic. 60¢ & 5¢

Swedes Iron Tacks—

S. S. Blued. 60¢ & 5¢

S. S. Tinned. 60¢ & 5¢

Lanc. Blued. 55¢

Lanc. Tinned. 60¢

Gimp and Lace Tacks—

S. S. Blued. 62¢ & 5¢

S. S. Tinned. 60¢ & 5¢

Lanc. Blued. 55¢

Lanc. Tinned. 60¢

Basket and Trimmers' Tacks—

S. S. Blued. 52¢ & 5¢

S. S. Tinned. 60¢ & 5¢

Hungarian Nails. 60¢

Cominot and Patent Brads. 55¢

Leathered Tacks. 10¢

Brush Tacks, S. S. 60¢

Looking Glass Tacks, S. S. 35¢

Picture-Frame Points, S. S. 35¢

Finishing Nails. 60¢

Trunk and Coat Nails—

Black. 62¢ & 5¢

Tinned or Coppered. 68¢ & 5¢

Basket Nails. 60¢

Chair Nails. 52¢ & 5¢

Cigar Box Nails. 45¢

Tip Capped Nails. 50¢

Miscellaneous—

Doubie Point. 90¢ & 90¢ & 10¢

Wire Carpet Nails. 50¢ & 10¢

Claw Handle Carpet. \$ gross \$4.00

Bonnie Blue. ¾ box 1 50

Extra discount 25¢ & 25%

Pail Nye Brad Box. 4 00

Parisian Gilt Nails, cartoon. 50

Home Tacks, No. 50. ¾ case (12 cartons). \$36.00; No. 100, ¾ case (12 cartons). \$72.00

Home Nails, No. 200. ¾ case (12 cartons). \$30.00; No. 400, ¾ case (12 cartons). \$60.00

Upholsterers' Nails. 50¢ & 10¢

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list. 50¢ & 10¢

See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. \$8.75; 60-gal. \$11 each. 50¢ & 10¢

Tapes, Measuring—

American. 40¢ & 40¢ & 5¢

Spring. 40¢

Chesterman's, Regular list. 25¢ & 30¢

Tapes, Measuring—

American. 40¢ & 40¢ & 5¢

Spring. 40¢

Chesterman's, Regular list. 25¢ & 30¢

Tapes, Measuring—

American. 40¢ & 40¢ & 5¢

Spring. 40¢

Chesterman's, Regular list. 25¢ & 30¢

Tapes, Measuring—

American. 40¢ & 40¢ & 5¢

Spring. 40¢

CURRENT METAL PRICES.

MAY 24, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

**IRON AND STEEL—
Bar Iron from Store**

Common Iron:
1 to 2 in. round and square... \$3 lb 1.80 @ 1.90¢
1 to 6 in. x 3/8 to 1 in.... \$3 lb 1.90 @ 2.00¢
Refined Iron:
1 to 2 in. round and square... \$3 lb 2.10 @ 2.20¢
1 to 4 in. x 3/8 to 1 in.... \$3 lb 2.00 @ 2.10¢
Rods—% and 11/16 round and sq. \$3 lb 2.20 @ 2.30¢
Bands—1 to 6 x 3/16 to No. 12... \$3 lb 2.20 @ 2.30¢
"Burden Best" Iron, base price, \$3 lb..... 3.00¢
Burden's "H. B. & S." Iron, base price..... \$3 lb..... 2.80¢
"Ulster"..... \$3 lb..... 3.00¢
Norway Bars..... 3.75 @ 4.00¢
Norway Shapes..... 4.50 @ 5.00¢

Merchant Steel from Store—

Open-Hearth and Bessemer Machinery, Tire Calk, Tire and Sleigh Shoe, base price in small lots..... 23¢
Best Cast Steel, base price in small lots. 8¢
Best Cast Steel Machinery, base price in small lots 5¢

Sheet Iron from Store—

Black—
Common R. G. Cleaned American. American.
Nos. 10 to 16..... \$3 lb 2 1/4 @ 3 1/4¢
17 to 20..... \$3 lb 3 @ 3 1/4¢
21 to 24..... \$3 lb 3 1/4 @ 3 1/4¢
25 and 26..... \$3 lb 3 1/2 @ 3 1/4¢
27..... \$3 lb 3 1/4 @ 3 1/4¢
28..... \$3 lb 3 1/2 @ 3 1/4¢
American B. B..... \$3 lb 4 @ 4 1/4¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... \$3 lb 12¢ @ 13¢
Patent Planished..... \$3 lb A, 10¢; B, 9¢ 1/2¢
Craig Polished Sheet Steel..... \$3 lb, 8¢ 1/2¢

Galvanized.

B. B.
Nos. 10 to 16..... \$3 lb 4¢
17 to 22..... \$3 lb 4 1/4¢
23 to 24..... \$3 lb 4 1/2¢
25 to 26..... \$3 lb 4 1/4¢
27..... \$3 lb 5¢
28..... \$3 lb 5 1/4¢
29 to 30..... \$3 lb 6 1/4¢

English Steel from Store—

Best Cast..... \$3 lb 15¢
Extra Cast..... \$3 lb 16 1/2 @ 17¢
Swaged, Cast..... \$3 lb 16
Best Double Shear..... \$3 lb 15
Blister, 1st quality..... \$3 lb 12
German Steel, Best..... \$3 lb 10
2d quality..... \$3 lb 9
3d quality..... \$3 lb 8
Sheet Cast Steel, 1st quality..... \$3 lb 15¢
2d quality..... \$3 lb 14
3d quality..... \$3 lb 12 1/2¢
R. Mushet's "Special"..... \$3 lb 48¢
" " " Tитені"..... \$3 lb 75
" " Annealed..... \$3 lb 20

METALS—

Tin—
Banca, Pigs..... 22¢ @ 21 1/2¢
Straits, Pigs..... 21 1/2¢
Straits in Bars..... 22 1/2¢

Tin Plates—

Duty: 2 1/2¢ lb.
Charcoal Plates—Bright—
Guaranteed Plates command special prices, according to quality. Per box.
Melvin and Calland Grade, IC, 10 x 14..... \$6.50
" " " " IC, 12 x 12..... 6.75
" " " " IC, 14 x 20..... 6.50
" " " " IC, 20 x 28..... 13.00
" " " " IX, 10 x 14..... 8.50
" " " " IX, 12 x 12..... 8.75
" " " " IX, 14 x 20..... 8.50
" " " " IX, 20 x 28..... 17.00
" " " DC, 12 x 17..... 6.00
" " " DX, 12 x 17..... 8.00
Allaway Grade..... IC, 10 x 14..... 6.00
" " " " IC, 12 x 12..... 6.25
" " " " IC, 14 x 20..... 6.00
" " " " IC, 20 x 28..... 12.00
" " " " IX, 10 x 14..... 7.50
" " " " IX, 12 x 12..... 7.75
" " " " IX, 14 x 20..... 7.50
" " " " IX, 20 x 28..... 15.00
" " " DC, 12 x 17..... 5.50
" " " DX, 12 x 17..... 7.00

Coke Plates—Bright—

Steel Coke—IC, 10 x 14, 14 x 20..... \$5.50 @ 5.60
10 x 20..... 8.50
20 x 28..... 11.50 @ 12.00

IX, 10 x 14, 14 x 20..... @ 7.00

BV Grade—IC, 10 x 14, 14 x 20..... @ 5.60
Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.
Dean Grade—IC, 14 x 20..... @ 5.65

20 x 28..... @ 11.00
IX, 14 x 20..... @ 6.40
20 x 28..... @ 12.80

Abecarne Grade—IC, 14 x 20..... @ 5.55
20 x 28..... @ 10.80

IX, 14 x 20..... @ 6.40
20 x 28..... @ 12.80
Tin Boiler Plates—

IXX, 4 x 26..... 112 sheets..... @ 18.35
IXX, 14 x 28..... 112 sheets..... @ 14.50

IXX, 14 x 31..... 112 sheets..... @ 16.00

American Terne Plates—Apollo.

IC, 14 x 20..... \$6.25
IC, 20 x 28..... 12.50

IX, 14 x 20..... 7.25
20 x 28..... 14.50

Copper—

DUTY: Pig, Bar and Ingot, 1 1/4¢; Old Copper, 1¢ $\frac{1}{2}$ lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot—

Lake..... @ 12¢
Ansonia grade Arizona..... @ 11 1/4¢
Ansonia grade Casting..... @ 11¢

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15% @ 25%, according to size of order.

Weights per sq. foot and prices per pound.

Not wider than	Weights per sq. foot and prices per pound.													
	Over 64 oz.	32	to 64 oz.	16	to 32 oz.	14	to 16 oz.	12	to 14 oz.	10	to 12 oz.	8	to 10 oz.	Less than 8 oz.
30-72	22	22	22	23	24	25	26	28	30	31	32	33	34	35
30-72	22	22	22	23	25	27	29	31	33	35	37	39	40	42
36-96	22	22	22	24	26	28	30	33	35	38	40	42	44	46
48-96	22	22	24	24	28	32	33	35	37	40	42	44	46	48
48-96	22	22	22	27	29	34	35	36	37	38	39	40	41	42
60-96	22	22	28	28	31	34	35	36	37	38	39	40	41	42
84-96	24	24	25	25	27	31	32	33	34	35	36	37	38	39
Ov'r 84 in. wide	25	27	—	—	—	—	—	—	—	—	—	—	—	—

Bolt Copper, $\frac{1}{8}$ inch diameter and over, per pound..... 22¢

Circles, Segments and Pattern Sheets, 60 in. diameter and less, $\frac{3}{4}$ lb ad valorem over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, $\frac{4}{5}$ lb ad valorem over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 96 in. diameter, $\frac{5}{6}$ lb ad valorem over prices of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. $\frac{1}{2}$ square foot and heavier, 1¢ $\frac{1}{2}$ lb over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. $\frac{1}{2}$ square foot, 24¢ $\frac{1}{2}$ lb over the foregoing prices.

All Polished Copper over 20 in. wide, 2¢ $\frac{1}{2}$ lb ad valorem over the foregoing prices.

14 ounce to square foot and heavier..... 28¢

12 ounce and up to 14 ounce to square foot..... 27¢

10 ounce and up to 12 ounce..... 26¢

Lighter than 10 ounce..... 24¢

Circles less than 8 inches diameter, 2¢ $\frac{1}{2}$ lb ad valorem.

Circles over 13 inches diameter are not classed as Copper Bottoms.

15% @ 25% discount, according to size of order.

All Polished Copper over 20 in. wide, 2¢ $\frac{1}{2}$ lb ad valorem over the foregoing prices.

Tinned—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢

Tinning sheets on one side, 30 x 60 each..... 30¢

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each..... 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each..... 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each..... 12¢

Tinning sheets on one side, other sizes, per square foot..... 24¢

For tinning both sides double the above prices.

Not larger than 30 x 60..... 24¢ $\frac{1}{2}$ lb

18 oz. and heavier..... 24¢ $\frac{1}{2}$ lb

14 oz..... 25¢ $\frac{1}{2}$ lb

12 oz..... 27¢ $\frac{1}{2}$ lb

10 oz..... 28¢ $\frac{1}{2}$ lb

8 oz..... 29¢ $\frac{1}{2}$ lb

6 oz..... 30¢ $\frac{1}{2}$ lb

4 oz..... 31¢ $\frac{1}{2}$ lb

2 oz..... 32¢ $\frac{1}{2}$ lb

1 oz..... 33¢ $\frac{1}{2}$ lb

1/2 oz..... 34¢ $\frac{1}{2}$ lb

1/4 oz..... 35¢ $\frac{1}{2}$ lb

1/2 oz..... 36¢ $\frac{1}{2}$ lb

1/4 oz..... 37¢ $\frac{1}{2}$ lb

1/8 oz..... 38¢ $\frac{1}{2}$ lb

1/16 oz..... 39¢ $\frac{1}{2}$ lb

1/32 oz..... 40¢ $\frac{1}{2}$ lb

1/64 oz..... 41¢ $\frac{1}{2}$ lb

1/128 oz..... 42¢ $\frac{1}{2}$ lb

1/256 oz..... 43¢ $\frac{1}{2}$ lb

1/512 oz..... 44¢ $\frac{1}{2}$ lb

1/1024 oz..... 45¢ $\frac{1}{2}$ lb

1/2048 oz..... 46¢ $\frac{1}{2}$ lb

1/4096 oz..... 47¢ $\frac{1}{2}$ lb</p

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